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Distribution maps for aquatic insects from Victorian rivers and streams: Ephemeropteran and Plecopteran nymphs and Trichopteran larvae

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Abstract

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Maps of the distribution of 327 species of the aquatic insect orders Ephemeroptera, Plecoptera and Trichoptera are provided for reference (undisturbed) sites in 27 of the 29 river basins in Victoria. These maps are based on approximately 13 years of sampling of the larvae and nymphs by the Environment Protection Agency, Victoria.

Keywords

Insecta, Ephemeroptera, Plecoptera, Trichoptera, aquatic insects, Australia, Victoria

Introduction

The maps presented here represent the distribution of Ephemeropteran, Plecopteran and Trichopteran (EPT) species at reference (undisturbed or least disturbed by human activity) river sites in Victoria. Victoria is the only state that has gathered species level invertebrate data for streams and rivers. Other states have also conducted extensive river sampling but their invertebrate material has usually only been identified to the family level (Simpson and Norris, 2000). Distributional data for Australian EPT species are therefore not available for states other than Victoria yet such information is essential for taxonomic and ecological studies.

The data on which these maps are based are from a large database on stream invertebrate communities compiled by the Environment Protection Authority, Victoria (EPA Vic, 2001). Since 1990 EPA Victoria has sampled invertebrate communities from reference sites in each of the 27 Australian Water Resources Council (AWRC) basins in Victoria that contain permanent flowing water. (A further 2 basins occur in Victoria but do not contain permanent water and thus have not been sampled.) At each site two habitats were sampled separately with a hand net: the habitat within 1m or so of the bank (the bank habitat) and the main channel habitat, usually a riffle (the channel habitat). The channel habitat was not always sampled in lowland regions because water depth was too great. Data from both the bank and channel habitats were combined to generate the distribution maps. All records were based solely on the identification of aquatic nymphal and larval material. Further details of survey design and collecting methods are given by Wells et al. (2002).

Currently the EPA database contains species or genus level data from 217 reference sites. Here we have mapped the distribution of 327 species of Ephemeroptera, Plecoptera and Trichoptera. These species constitute 31% of the 1066 species recognised in the Victorian EPA database. The EPT species were chosen because they are generally considered to be most sensitive to the typical disturbances inflicted on running waters (Marchant et al., 1995) and changes in their distribution with time will therefore be of interest to both ecologists and managers. Most can also be reliably identified to species, using available identification keys for Australian taxa (Hawking, 2000).

We do not comment on each map. To do so would turn this essentially simple mapping exercise into a biogeographic study. Given the taxonomic uncertainty and lack of formal description for some of the EPT species we believe it would be premature to attempt a biogeographic analysis. Such a study would also require detailed taxonomic input that we cannot provide. In our view, the maps have most value as an archive for the future: they indicate distribution at reference sites during the 1990s and early 2000s. Distributions may change radically with future developments in the basins. Thus the maps provide a perspective which will become increasingly informative as time goes by.

These maps are a by product of a study of stream biodiversity that we have undertaken using the EPA Vic data. (These analyses will be published elsewhere.) By providing these distributional data those few taxonomists and the much larger group of freshwater ecologists (who have to identify stream invertebrates) can at least see where EPT species are currently thought to occur in Victoria. We acknowledge that identification errors may well have crept into the data, despite the quality control exercised by the EPA Vic (Metzeling, personal communication). Thus some of the mapped points may be inaccurate but can be checked against the specimens themselves (currently held by EPA Vic). Nevertheless, the maps provide a starting point for those who wish to examine the distribution of these taxa more closely.

Taxa

The distribution of each of the following species is mapped. Codes refer to species codes as listed in the EPA Vic database.

Ephemeroptera

Ameletopsidae

Mirawara species AV2; *Mirawara* species AV 1

Baetidae

Baetidae Genus 3 species 4; *Baetis* EPA species 1; *Baetis* EPA species 2; *Baetis* EPA species 4; *Baetis* EPA species 5; *Baetis* EPA species 6; *Baetis* EPA species 7; *Baetis* EPA species 9; *Baetis frater*; *Bungona narilla*; *Centroptilum* species unident; *Cloeon* species unident; *Edmundsiops hickmani*

Caenidae

Irpacaenis deani; *Irpacaenis* species D; *Tasmanocoenis arcuata*; *Tasmanocoenis* species B; *Tasmanocoenis tillyardi*; *Tasmanocoenis tonnoiri*

Coloburiscidae

Coloburiscoides LV species A; *Coloburiscoides* species AV1; *Coloburiscoides* species AV2

Leptophlebiidae

Atalomicria species AV1; *Atalophlebia albiterminata*; *Atalophlebia australis*; *Atalophlebia* species AV2; *Atalophlebia* species AV4; *Atalophlebia* species AV5; *Atalophlebia* species AV6; *Atalophlebia* species AV7; *Atalophlebia* species AV8; *Atalophlebia* species AV9; *Atalophlebia* species AV12; *Atalophlebia* species AV13; *Austrophlebioides marchanti*; *Austrophlebioides pusillus*; *Austrophlebioides* species AV2; *Garinjuga* species AV1; *Jappa* species AV2; *Jappa* species AV3; *Jappa* species AV4; *Kirrara procera*; *Koorrnonga* species AV1; *Koorrnonga* species AV2; *Koorrnonga* species AV3; *Koorrnonga* species AV5; *Koorrnonga* species AV15; Leptophlebiidae Genus K species 1; Leptophlebiidae Genus Z species 1; *Neboissophlebia hamulata*; *Nousia* species AV1; *Nousia* species AV2; *Nousia* species AV3; *Nousia* species AV4; *Nousia* species AV5; *Nousia* species AV6; *Nousia* species AV11; *Nousia* species AV12; *Nousia* species AV17; *Tillyardophlebia rufosa*; *Tillyardophlebia* species AV3; *Tillyardophlebia* species AV4; *Ulmerophlebia* species AV1; *Ulmerophlebia* species AV2

Oniscigastridae

Tasmanophlebia lacuscoerulei; *Tasmanophlebia* species AV1; *Tasmanophlebia* species AV2

Siphlonuridae

Ameletoides lacusalbinae

Plecoptera

Austroperlidae

Acruroperla atra; *Austroheptura illiesi*; *Austroheptura neboissi*; *Austropentura victoria*

Eustheniidae

Cosmioperla kuna; *Eusthenia nothofagi*; *Eusthenia venosa*; *Thaumatoperla robusta*

Gripopterygidae

Dinotoperla brevipennis; *Dinotoperla christinae*; *Dinotoperla* EPA species 1; *Dinotoperla eucumbene*; *Dinotoperla fontana*; *Dinotoperla hirsuta*; *Dinotoperla serricauda thwaitesi*; *Eunotoperla kershawi*; *Illiesoperla australis*; *Leptoperla albicincta*; *Leptoperla bifida*; *Leptoperla* EPA species 1; *Leptoperla* EPA species 2; *Leptoperla* EPA species 3; *Leptoperla kimminsi*; *Leptoperla longicauda bifida*; *Leptoperla neboissi*; *Leptoperla primitiva*; *Leptoperla rubiconis*; *Leptoperla* species A; *Leptoperla tasmanica*; *Neboissoperla alpina*; *Newmanoperla thoreyi*; *Riekoperla alpina*; *Riekoperla darlingtoni*; *Riekoperla* EPA species 1; *Riekoperla karki reticulata* group; *Riekoperla montana*; *Riekoperla reticulata*; *Riekoperla rugosa*; *Riekoperla rugosa* group; *Riekoperla tuberculata* group; *Riekoperla williamsi*; *Trinotoperla irrorata*; *Trinotoperla montana*; *Trinotoperla nivata*

Notonemouridae

Austrocerca tasmanica; *Austrocercella mariannae*; *Austrocercella* species unident; *Austrocercella tillyardi*; *Austrocercoides* species unident; *Notonemoura maculata*

Trichoptera

Atriplectidae

Atriplectides dubius

Calamoceratidae

Anisocentropus bicoloratus

Calocidae

Caenota plicata; Calocidae/Helicophidae Genus G species AV1; *Tamasia acuta*; *Tamasia* species AV1; *Tamasia* species AV2; *Tamasia variegata*

Conoesucidae

Coenoria species AV2; *Coenoria* species AV4; *Coenoria* species AV1; *Coenoria* species AV5; *Conoesucus* species AV1; *Conoesucus* species AV3; *Conoesucus* species AV4; *Conoesucus* species AV5; *Costora delora*; *Costora ebenina*; *Costora* species AV1; *Costora* species AV3; *Hampa patona*; *Lingora* species AV1; *Matasia satana*; *Matasia* species AV1;

Ecnomidae

Ecnomina batyle; *Ecnomina* D species AV1; *Ecnomina* D species AV2; *Ecnomina* E species AV1; *Ecnomina* E species AV2; *Ecnomina* E species AV3; *Ecnomina* F species AV3; *Ecnomina* F species AV4; *Ecnomina* F species AV5; *Ecnomus continentalis*; *Ecnomus cygnitus*; *Ecnomus deani*; *Ecnomus* EPA species 1; *Ecnomus* EPA species 2; *Ecnomus* EPA species 4; *Ecnomus nibbor*; *Ecnomus pansus*; *Ecnomus russellius*; *Ecnomus tillyardi*; *Ecnomus turgidus*

Glossosomatidae

Agapetus monticolus; *Agapetus* species unident

Helicophidae

Alloecella grisea; *Alloecella* species AV2; *Heloccabus* species AV1

Helicopsychidae

Helicopsyche EPA species AV12; *Helicopsyche heacota*; *Helicopsyche murrumba*; *Helicopsyche* species AV1; *Helicopsyche tillyardi*; *Helicopysche cochleaetesta*

Hydrobiosidae

Apsilochorema gisbum; *Apsilochorema obliquum*; *Austrochorema* species unident; *Ethochorema brunneum*; *Ethochorema turbidum*; *Ethochorema turbidum brunneum*; Hydrobiosidae Genus A species 1; *Koetonga clivicola*; *Megogata necopina*; *Psyllobetina attunga*; *Psyllobetina cumberlandica*; *Psyllobetina locula*; *Ptychobiosis nigrita*; *Ptychobiosis* species AV1; *Tanjilana akroreia*; *Tanjilana zothecula*; *Taschorema* EPA species 2; *Taschorema evansi*; *Taschorema kimminsi*; *Taschorema rugulum*; *Ulmerochorema lentum*; *Ulmerochorema membrum*; *Ulmerochorema onychion*; *Ulmerochorema rubiconum*;

Ulmerochorema rubiconum group; *Ulmerochorema seona*; *Ulmerochorema stigma*

Hydropsychidae

Asmicridea edwardsi; *Asmicridea* species AV1; *Asmicridea* species AV2; *Austropsyche* species 1; *Austropsyche victoriana*; *Baliomorpha dubia*; *Cheumatopsyche* species AV1; *Cheumatopsyche* species AV2; *Cheumatopsyche* species AV3; *Cheumatopsyche* species AV4; *Cheumatopsyche* species AV5; *Cheumatopsyche* species AV6; *Diplectrona* species AV1; *Diplectrona* species AV2; *Diplectrona* species AV3; *Diplectrona* species AV4; *Smicrophylax* species 1; *Smicrophylax* species 2; *Smicrophylax* species 4

Hydroptilidae

Acanthotrichia bilamina; *Hellyethira allynensis*; *Hellyethira basilobata*; *Hellyethira* EPA species 1; *Hellyethira* EPA species 3; *Hellyethira* EPA species 4; *Hellyethira* EPA species 5; *Hellyethira* EPA species 7; *Hellyethira* EPA species 8; *Hellyethira* EPA species 9; *Hellyethira* EPA species 10; *Hellyethira eskensis*; *Hellyethira exserta*; *Hellyethira malleoforma*; *Hellyethira simplex*; *Hydroptila acinacis*; *Hydroptila calcara*; *Hydroptila losida*; *Hydroptila scamandra*; *Maydenoptila cuneola*; *Maydenoptila* EPA species 1; *Maydenoptila pseudorupina*; *Maydenoptila rupina*; *Orthotrichia aberrans*; *Orthotrichia conferta*; *Oxyethira columba*

Kokiriidae

Tanjistomella verna; *Taskiria otwayensis*

Leptoceridae

Condocerus paludosus; *Lectrides varians*; *Leptocerus* EPA species 1; *Leptorussa darlingtoni*; *Notalina arena*; *Notalina bifaria*; *Notalina* EPA species 3; *Notalina fulva*; *Notalina ordina*; *Notalina salina*; *Notalina* species AV20; *Notalina spira*; *Notoperata* species unident; *Oecetis* EPA species 1; *Oecetis* EPA species 2; *Oecetis* EPA species 3; *Oecetis* EPA species 5; *Oecetis* EPA species 6; *Oecetis* EPA species 8; *Oecetis* EPA species 9; *Oecetis* EPA species 11; *Oecetis laustra*; *Oecetis* SRV species 36; *Russobex cuneatus*; *Symphitoneuria opposita*; *Triaenodes* EPA species 1; *Triaenodes* EPA species 2; *Triaenodes* EPA species 3; *Triaenodes* EPA species 4; *Triaenodes* EPA species 5; *Triaenodes volda*; *Triplectides altenogus*; *Triplectides australicus*; *Triplectides australicus* group; *Triplectides australis*; *Triplectides ciuskus*; *Triplectides elongatus*; *Triplectides magnus*; *Triplectides proximus*; *Triplectides similis*; *Triplectides truncatus*; *Triplectides varius*; *Triplectides volda*; *Triplectidina nigricornis*; *Triplexa villa*

Limnephilidae

Archaeophylax canarus; *Archaeophylax ochreus*

Odontoceridae

Barynema costatum; *Barynema* EPA species 1; *Marilia bola*; *Marilia fusca*

Philopotamidae

Chimarra australica; *Chimarra monticola*; *Hydrobiosella* species 1; *Hydrobiosella* species 2; *Hydrobiosella* species 4; *Hydrobiosella* species 5; *Hydrobiosella* species 7; *Hydrobiosella* species 13; *Hydrobiosella waddama*

Philoreithridae

Aphilorheithrus EPA species 6; *Aphilorheithrus* species AV1; *Aphilorheithrus* species AV2; *Aphilorheithrus* species AV3; *Aphilorheithrus* species AV4; *Aphilorheithrus* species AV5; *Austrheithrus dubitans*; *Kosrheithrus tillyardi*

Polycentropodidae

Neureclipsis napaea; *Paranyctiophylax* species 2; *Paranyctiophylax* species 3; *Paranyctiophylax* species 4; *Paranyctiophylax* species AV5; *Plectrocnemia* species unident; Polycentropidae Genus I species AV1

Stenopsychidae

Stenopsychidae species unident

Tasimiidae

Tasimia species 1; *Tasimia* species 2

Maps

A single map is provided for each species, in alphabetical order. These are preceded by a map showing the AWRC basin names, and a map showing all sample sites. The points on the maps indicate the occurrence of at least one individual of the named species. In many cases a point represents multiple records at that site. Specimen-level data, including latitude and longitude, on which these maps are based are held by EPA Vic.

Acknowledgements

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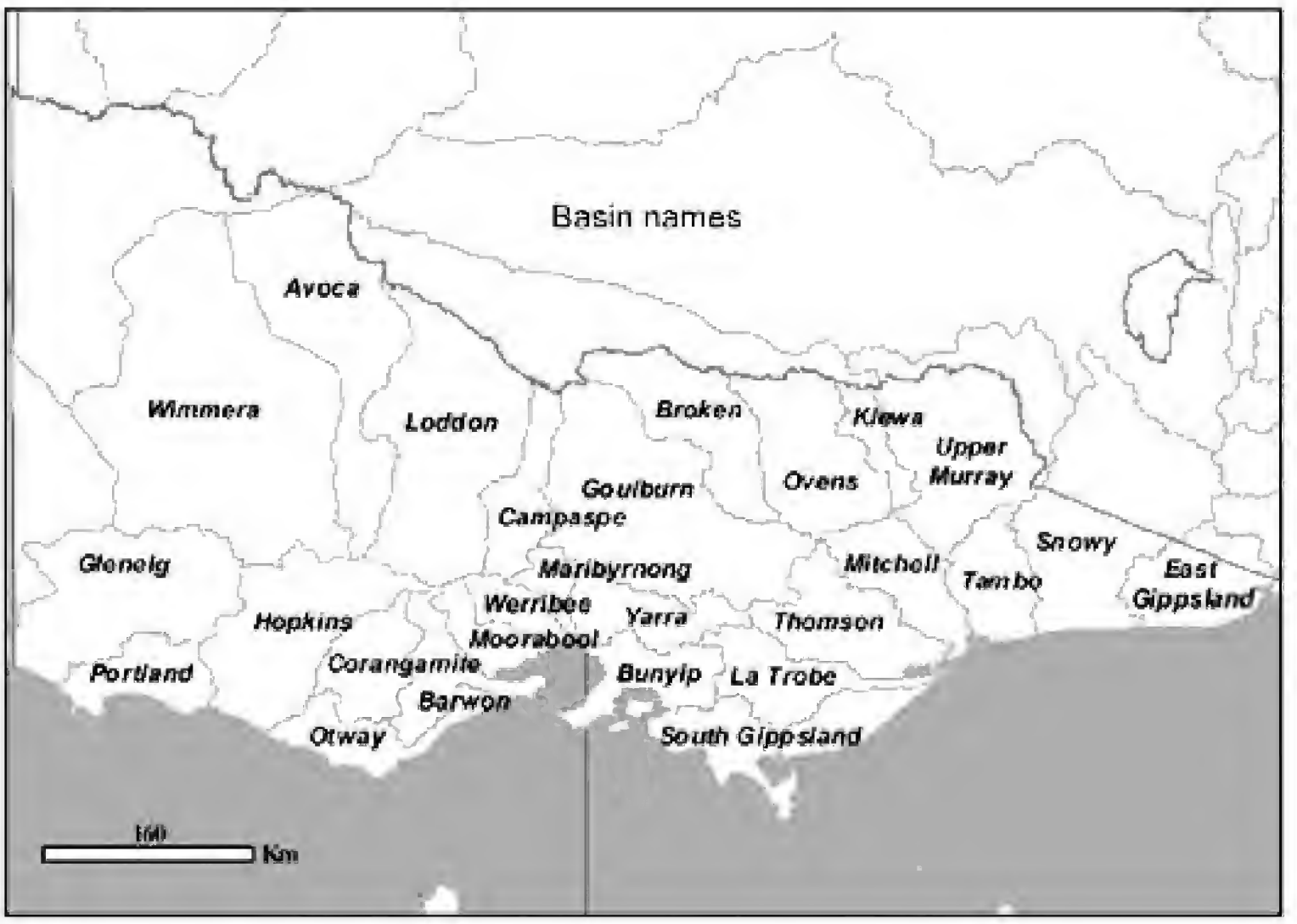
Basin names
Avoca
Wimmera
Loddon
Broken
Kiewa
Upper Murray
Ovens
Goulburn
Campaspe
Glenelg
Maribyrnong
Mitchell
Snowy
East Gippsland
Tambo
Hopkins
Werribee
Yarra
Thomson
Moorabool
Portland
Corangamite
Bunyip
La Trobe
Barwon
Otway
South Gippsland
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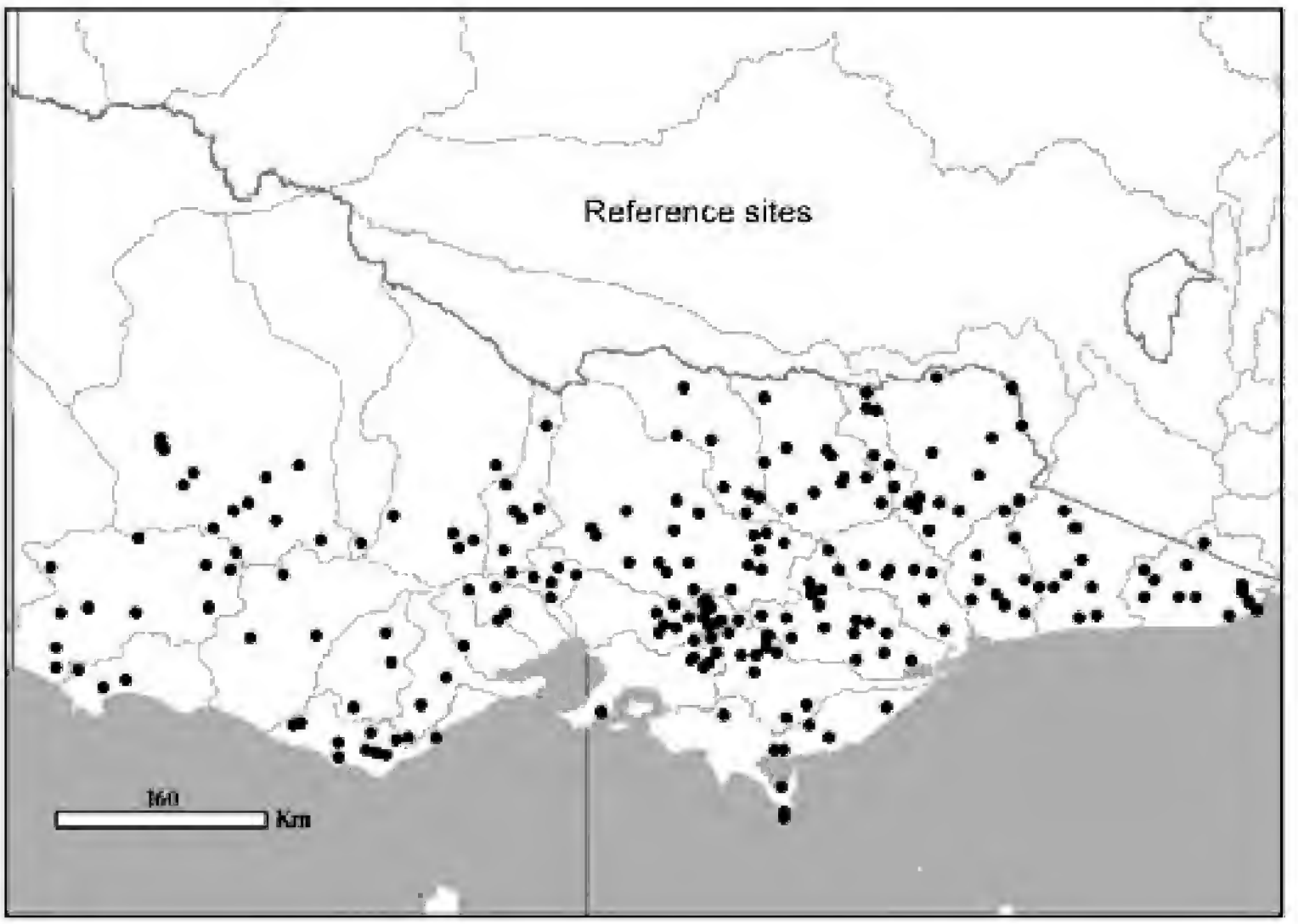
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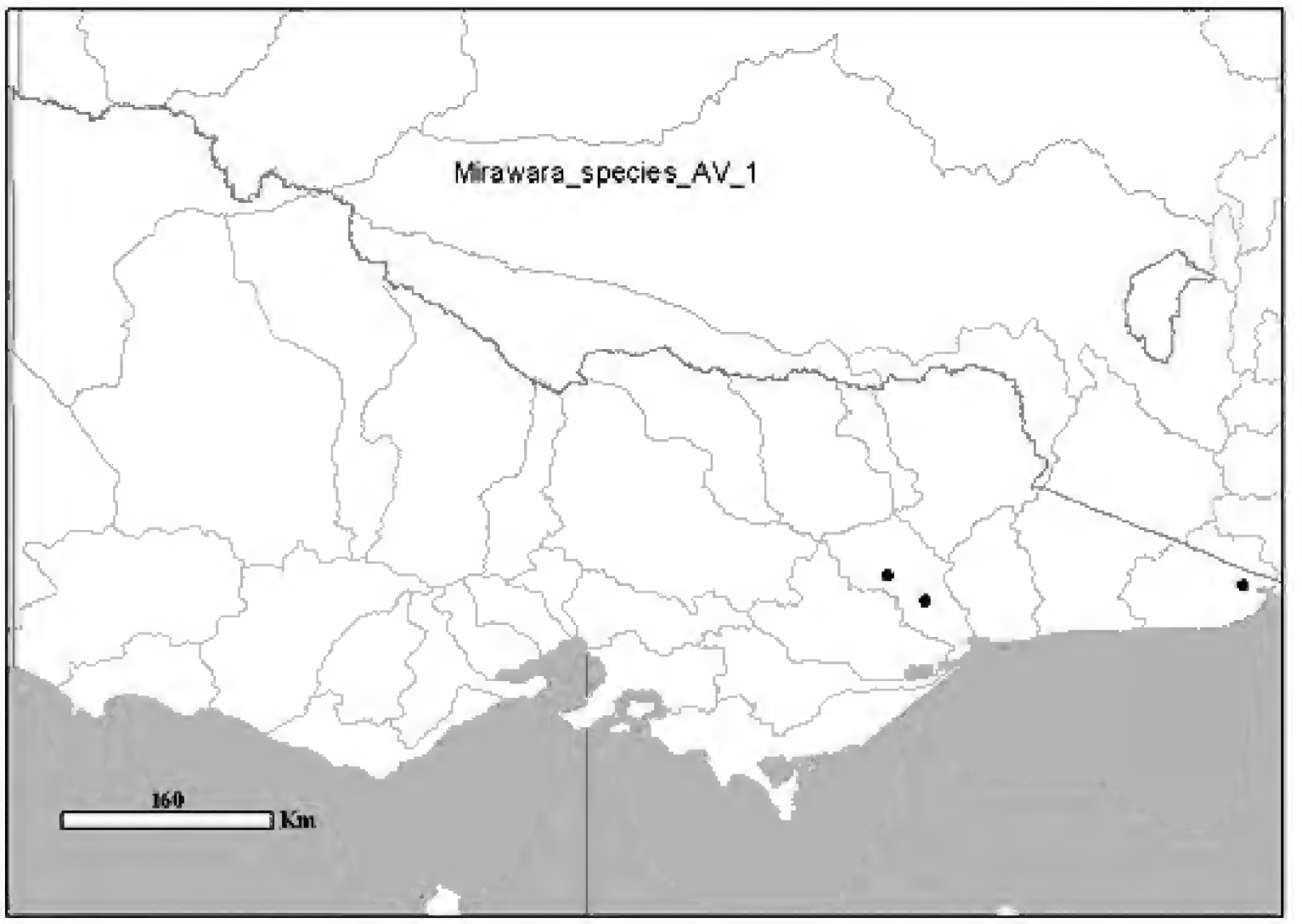
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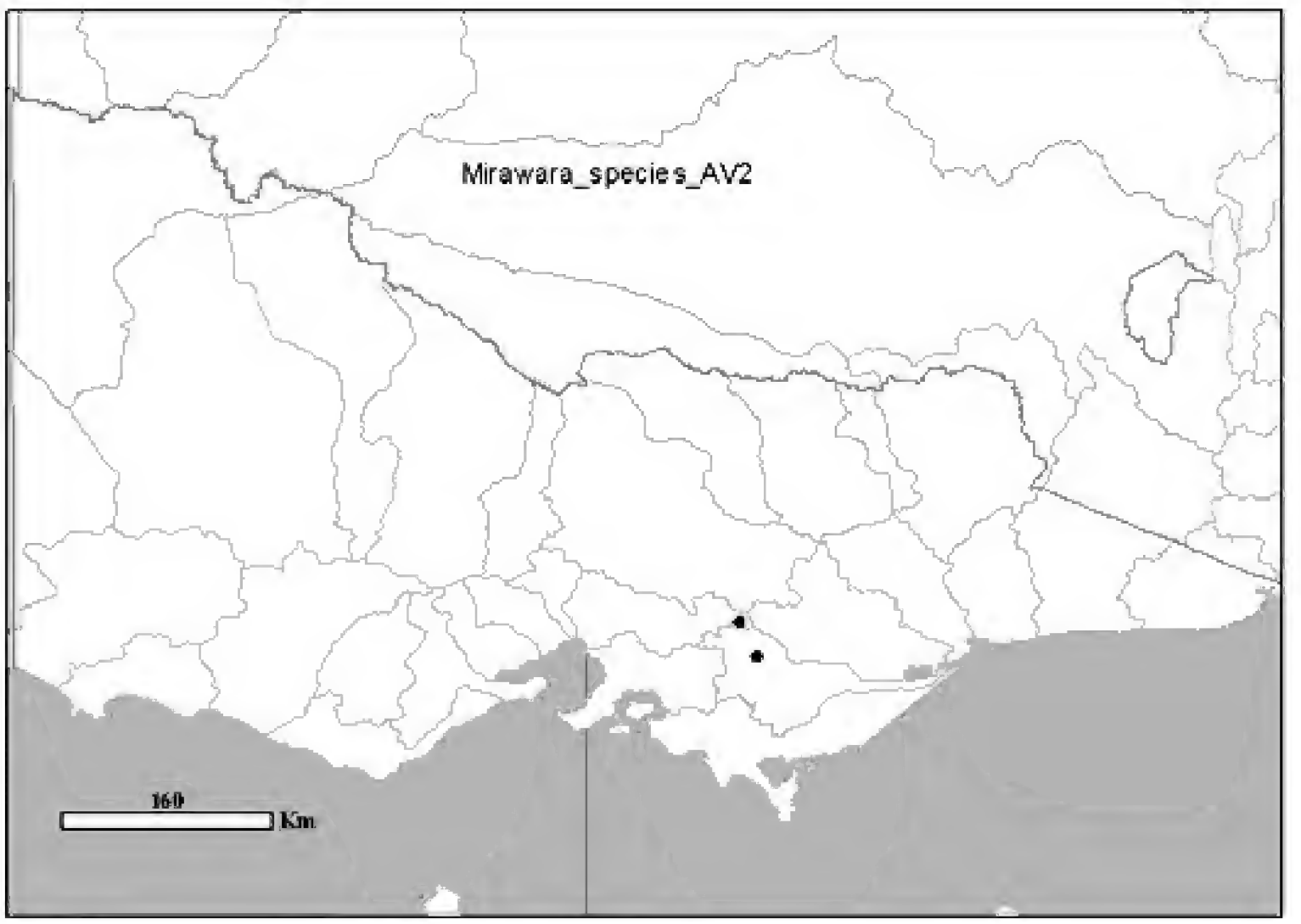
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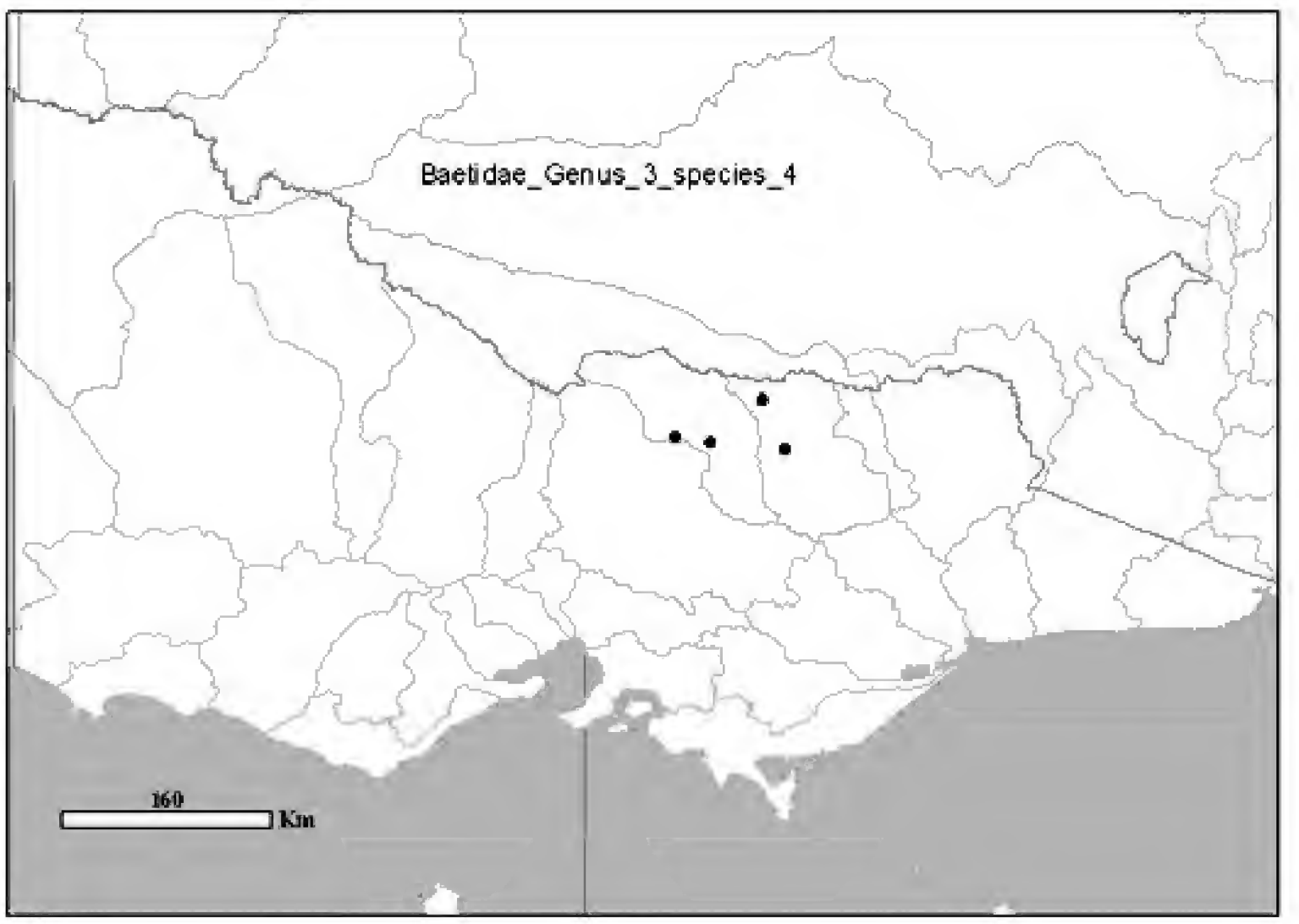
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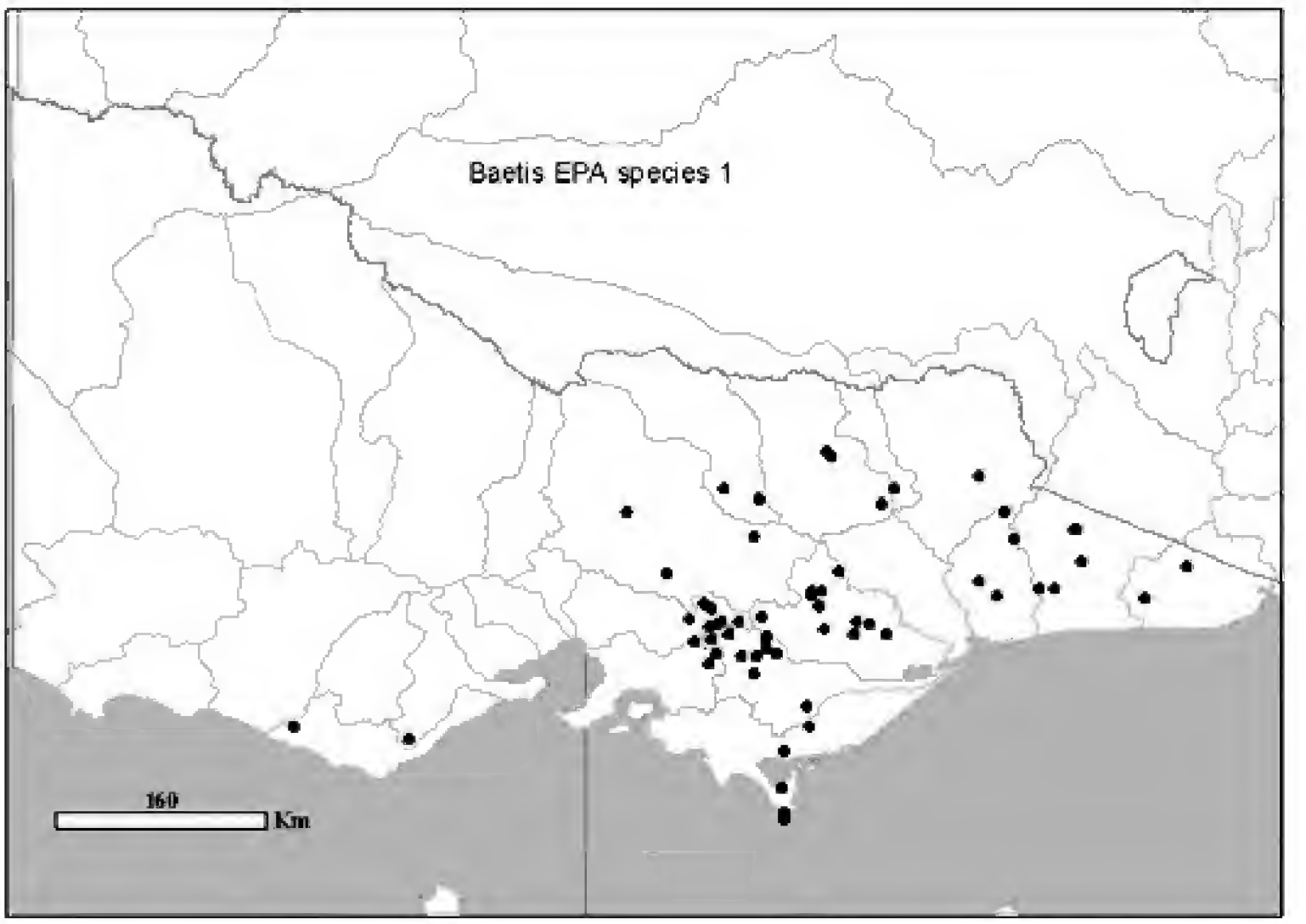
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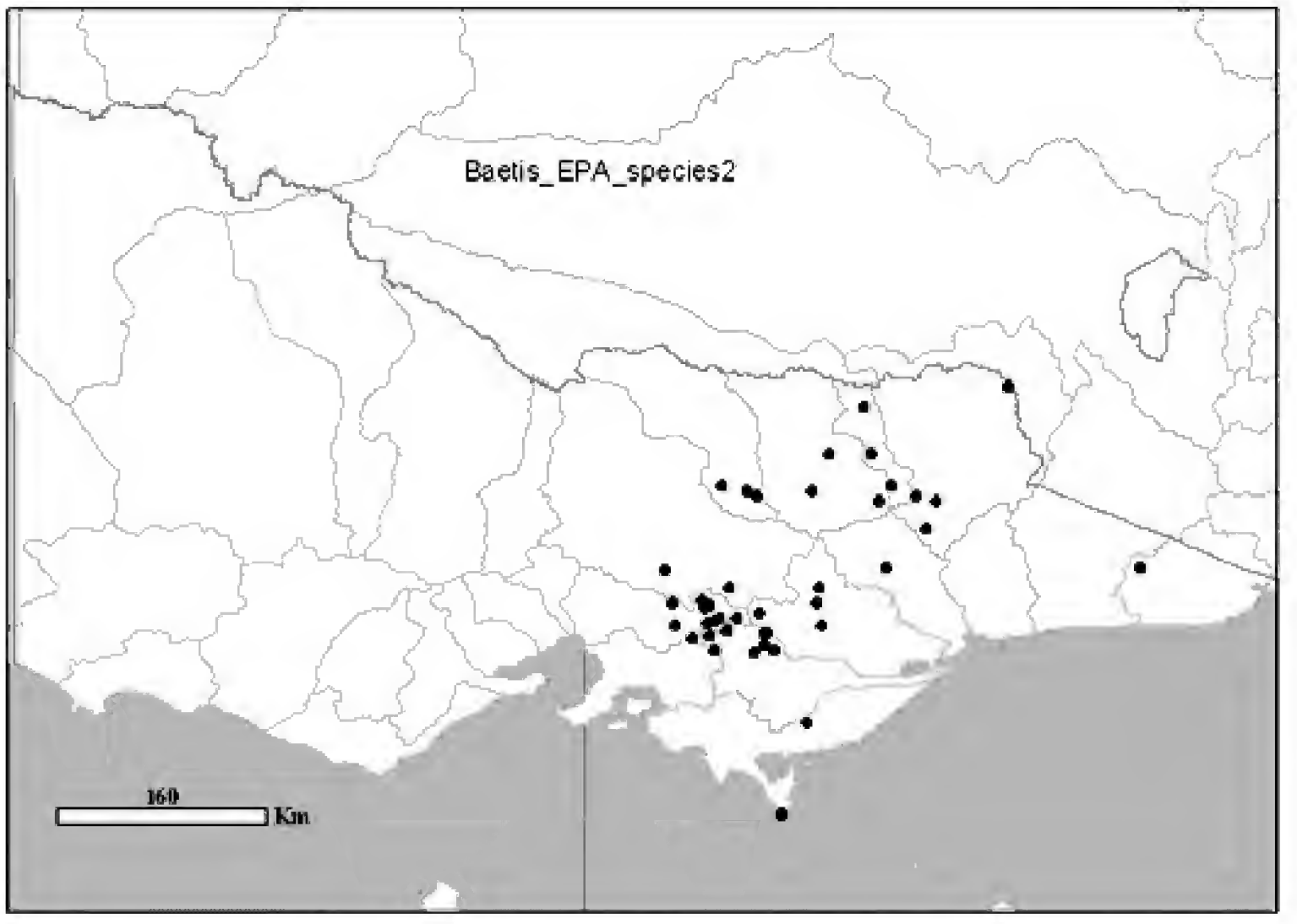
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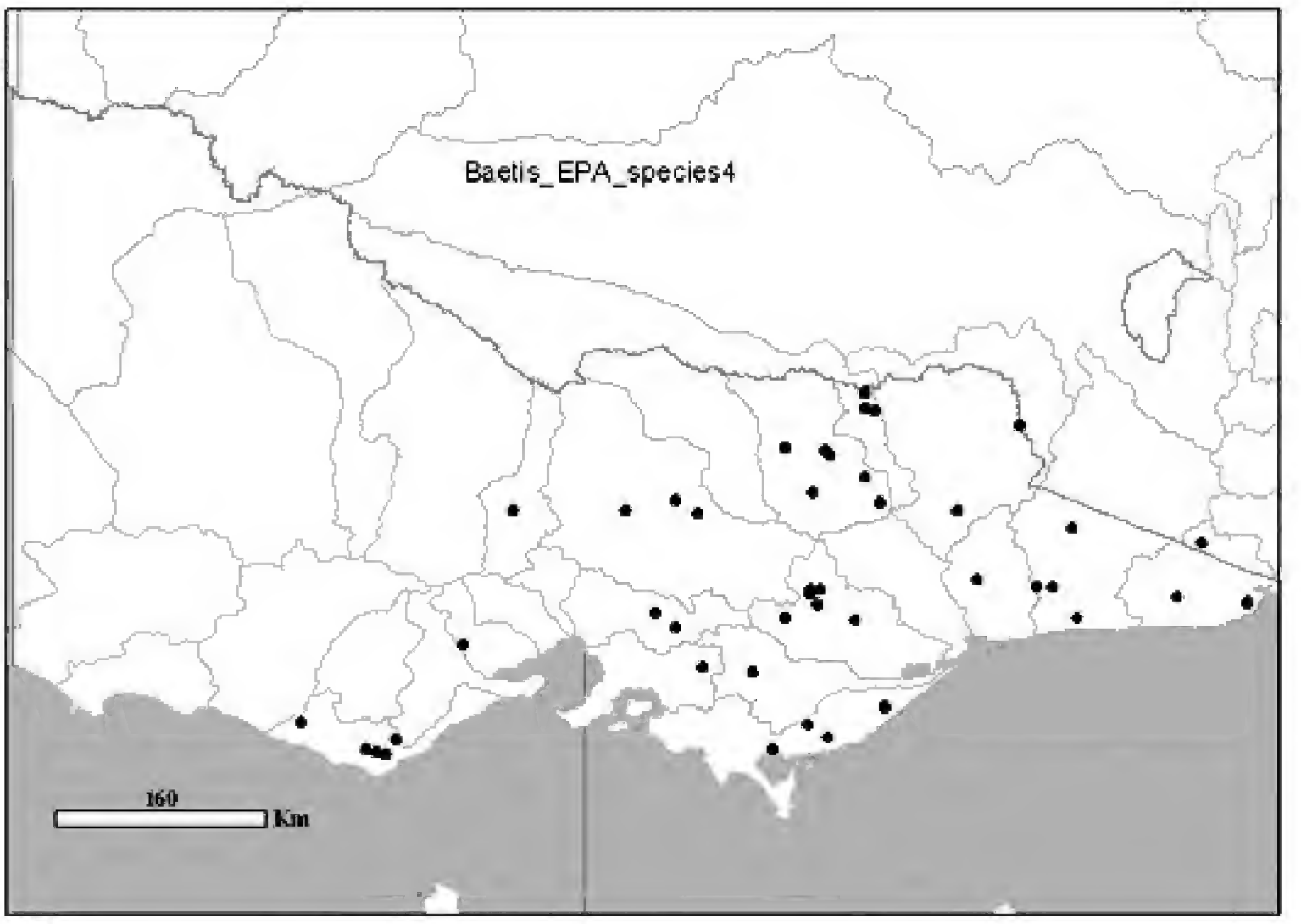
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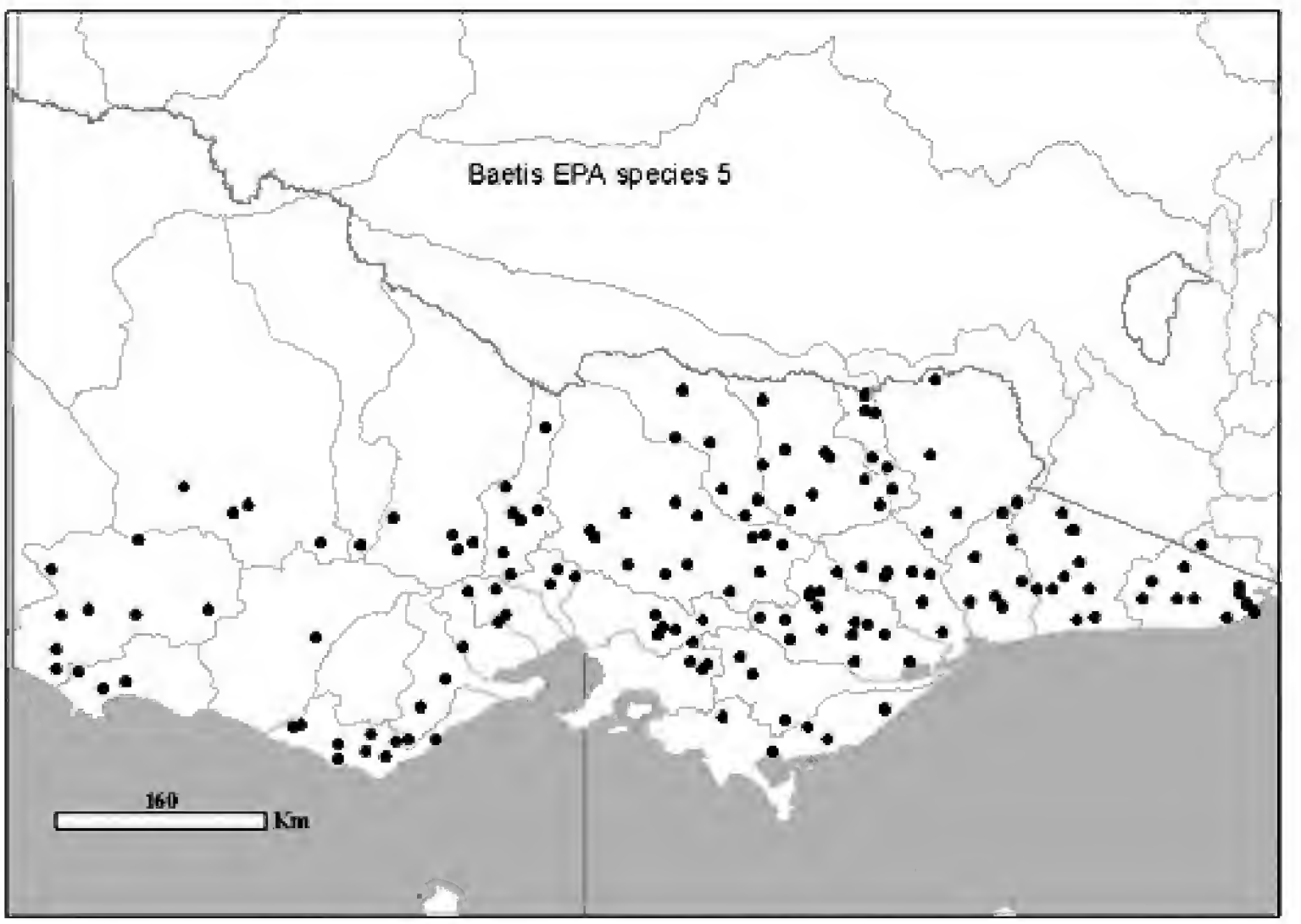
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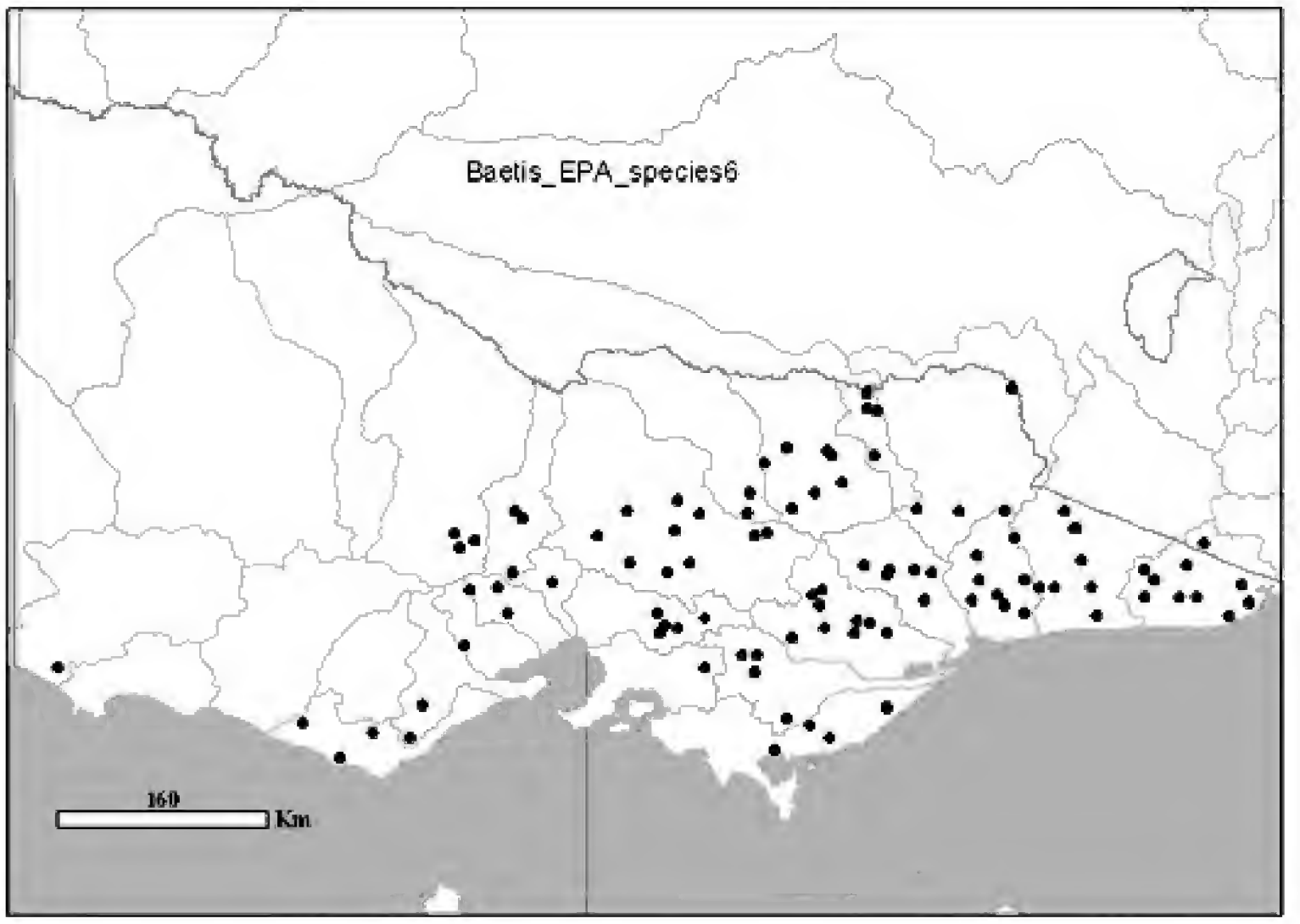
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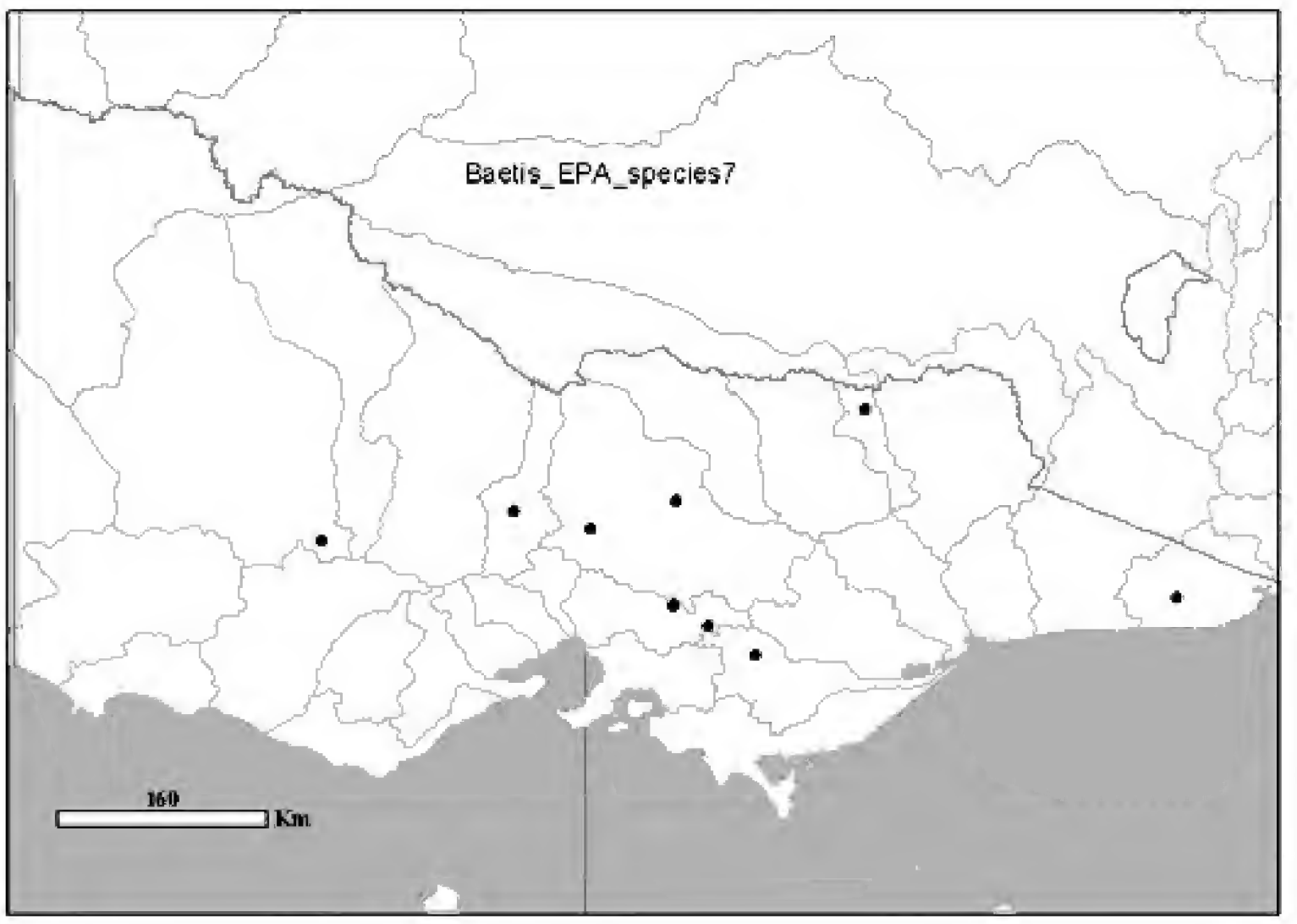
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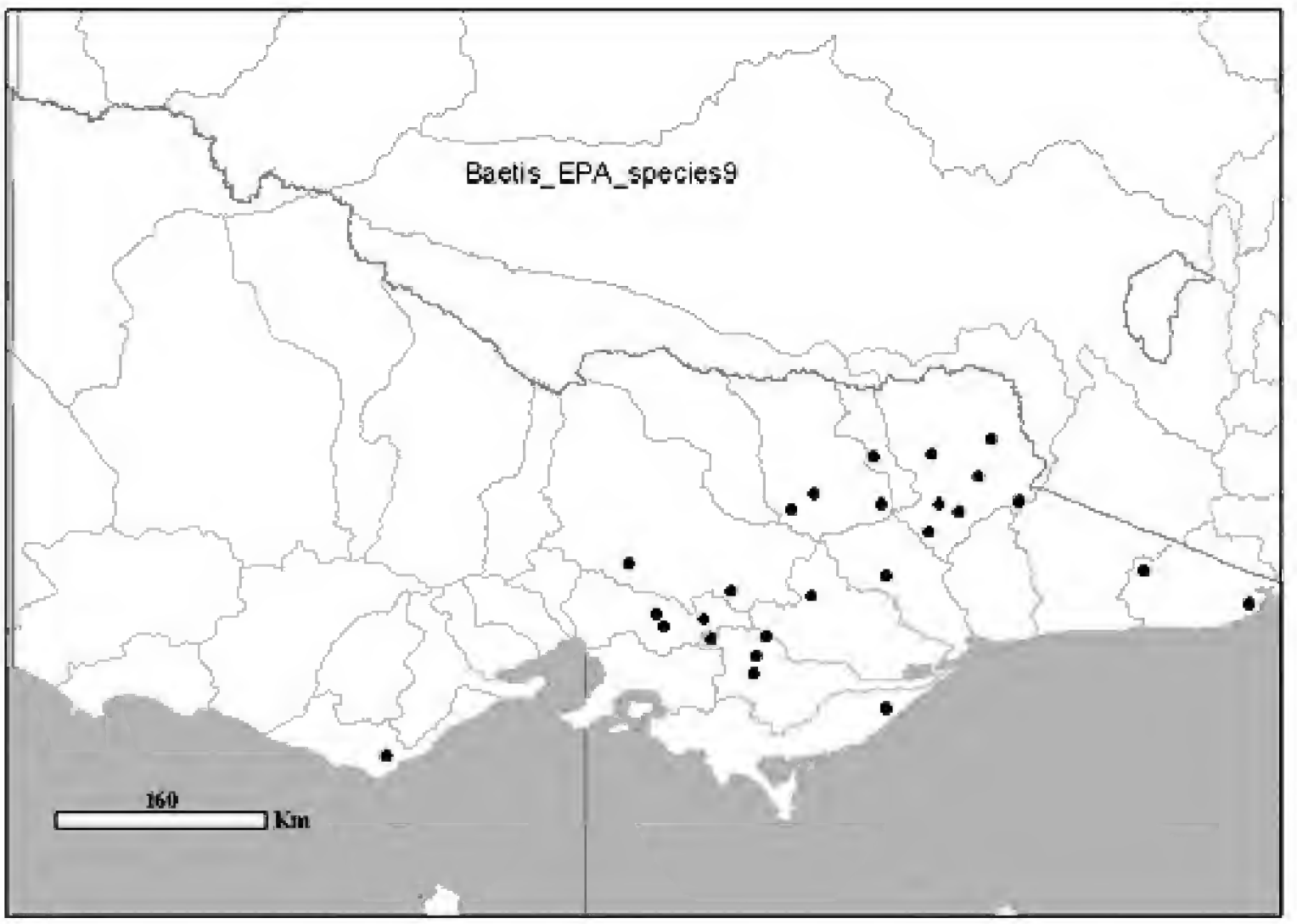
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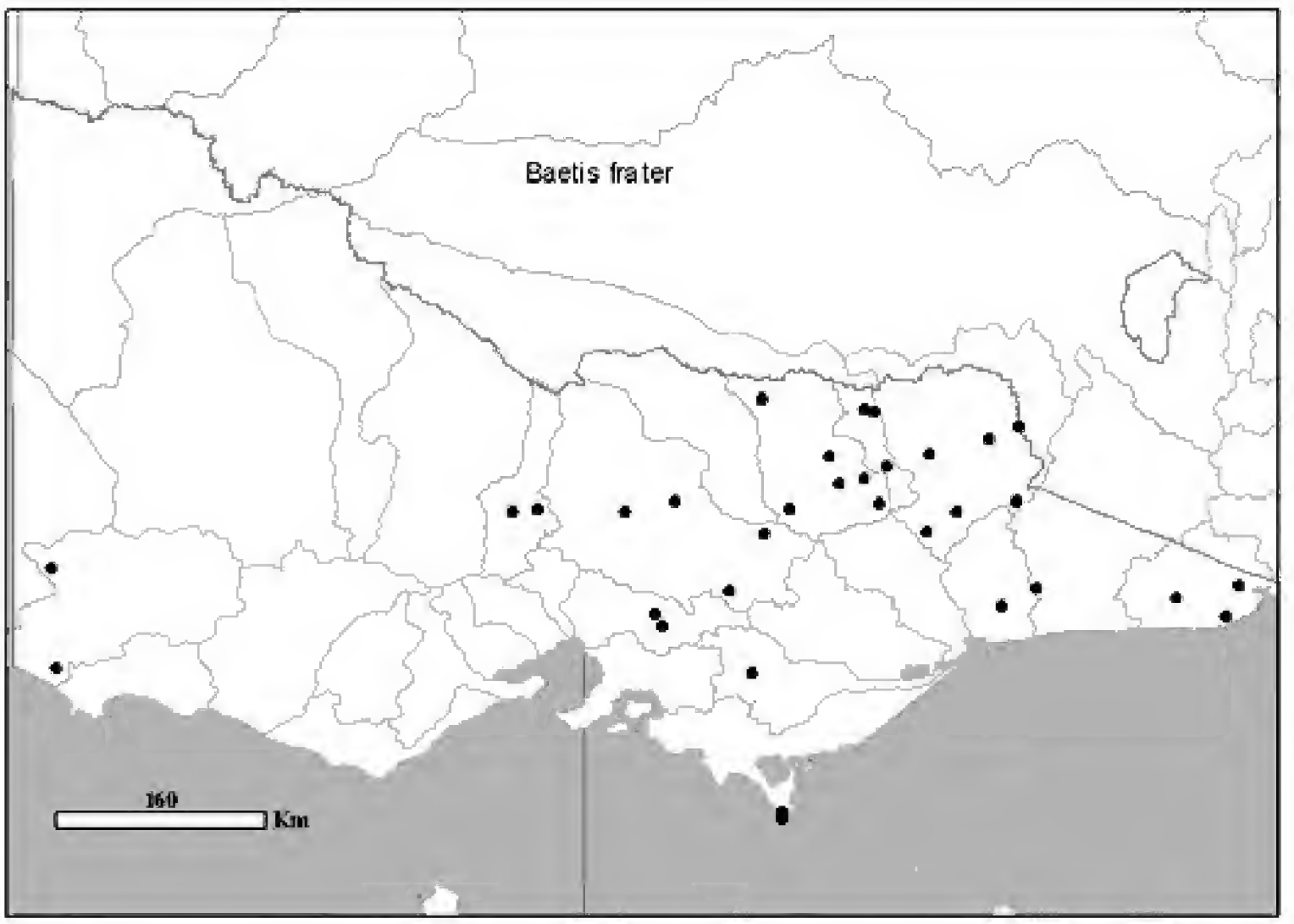
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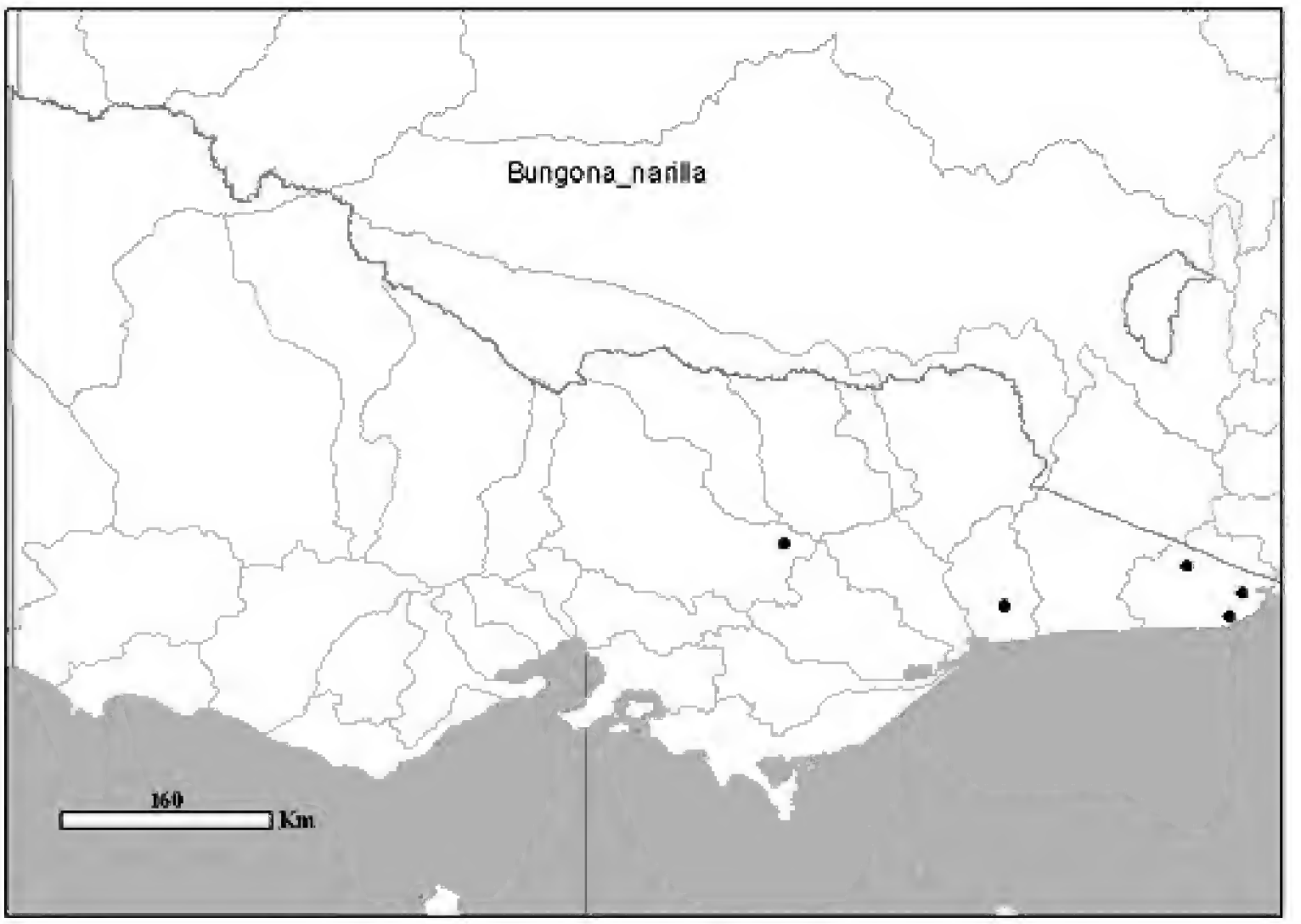
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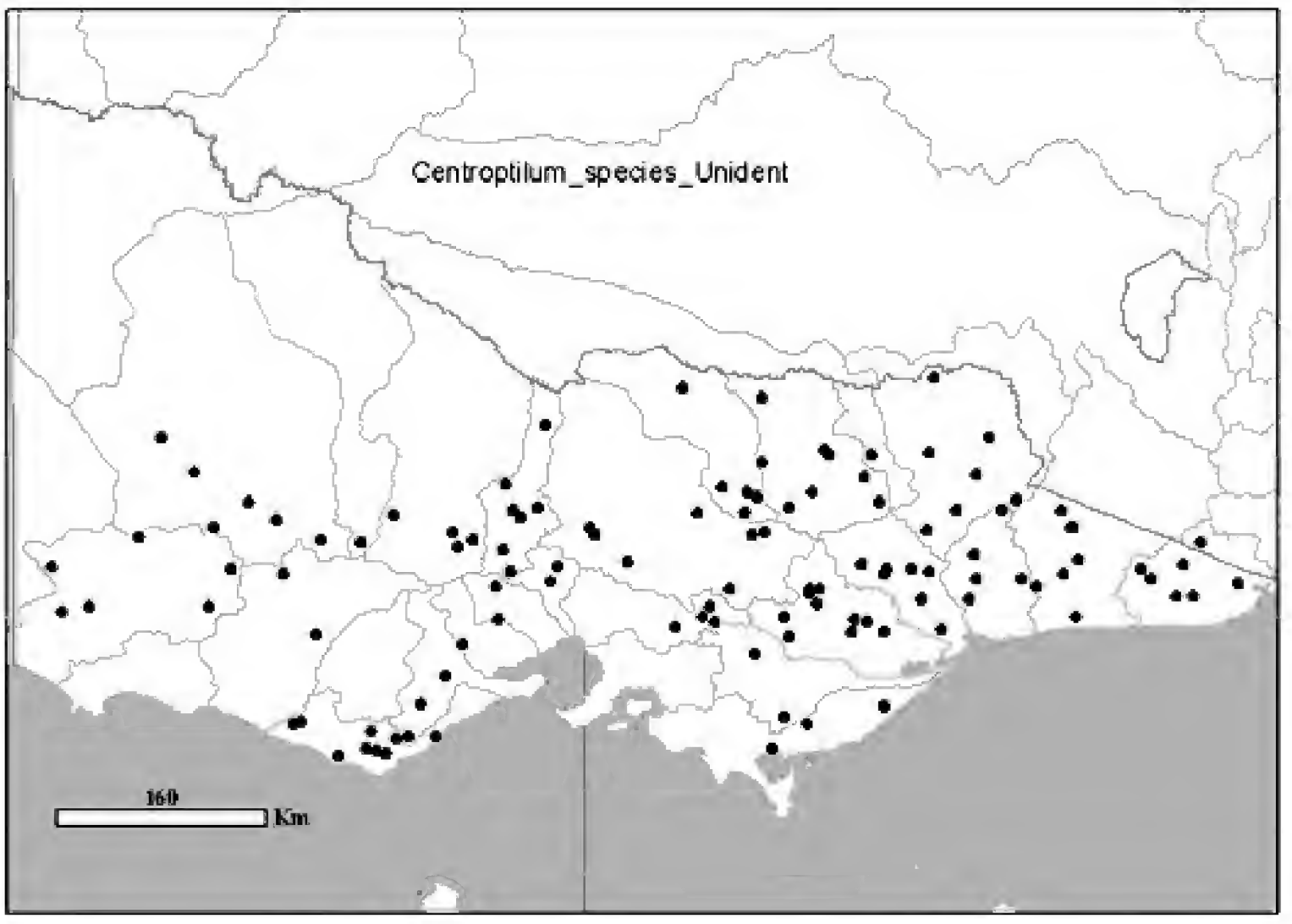
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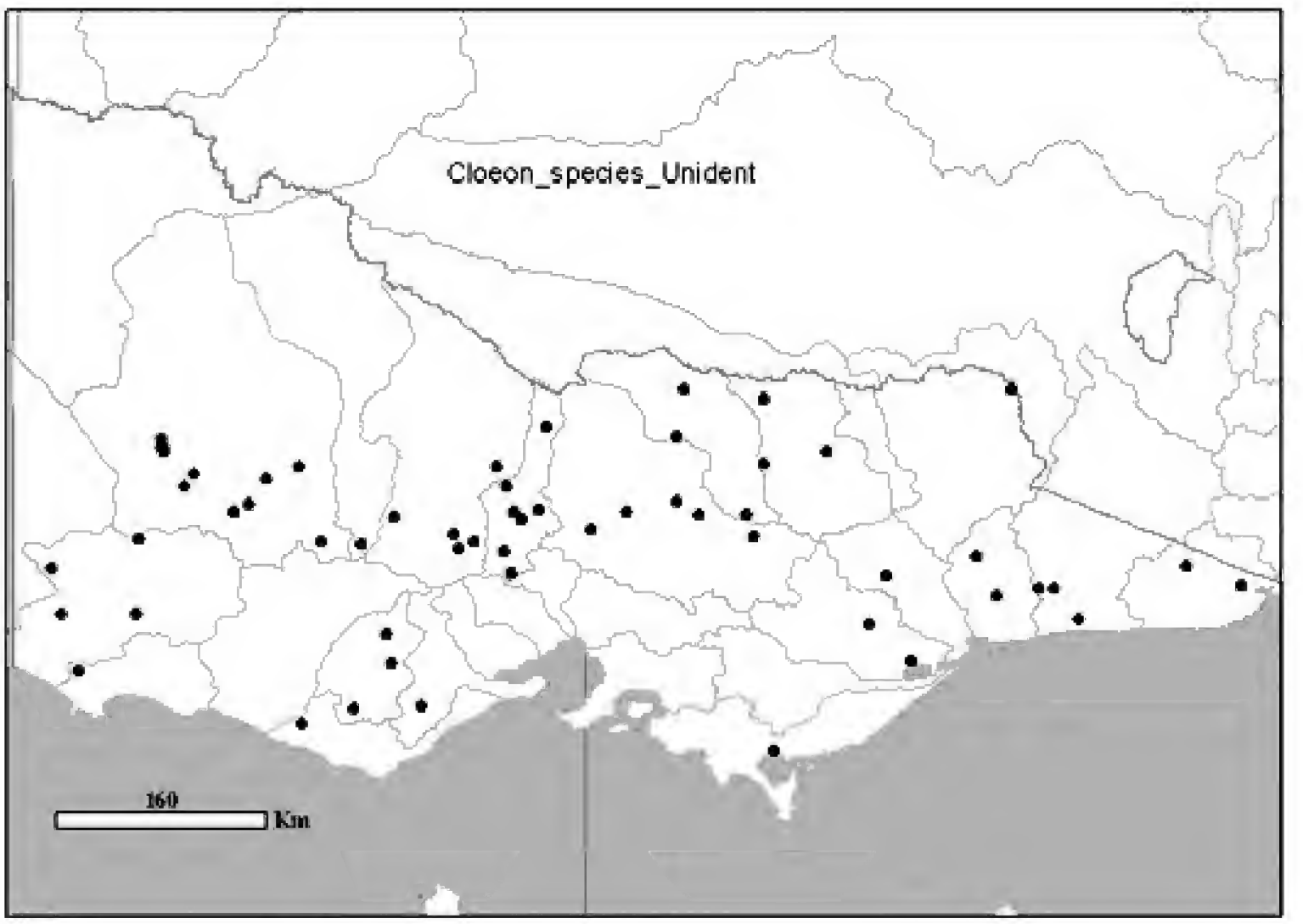
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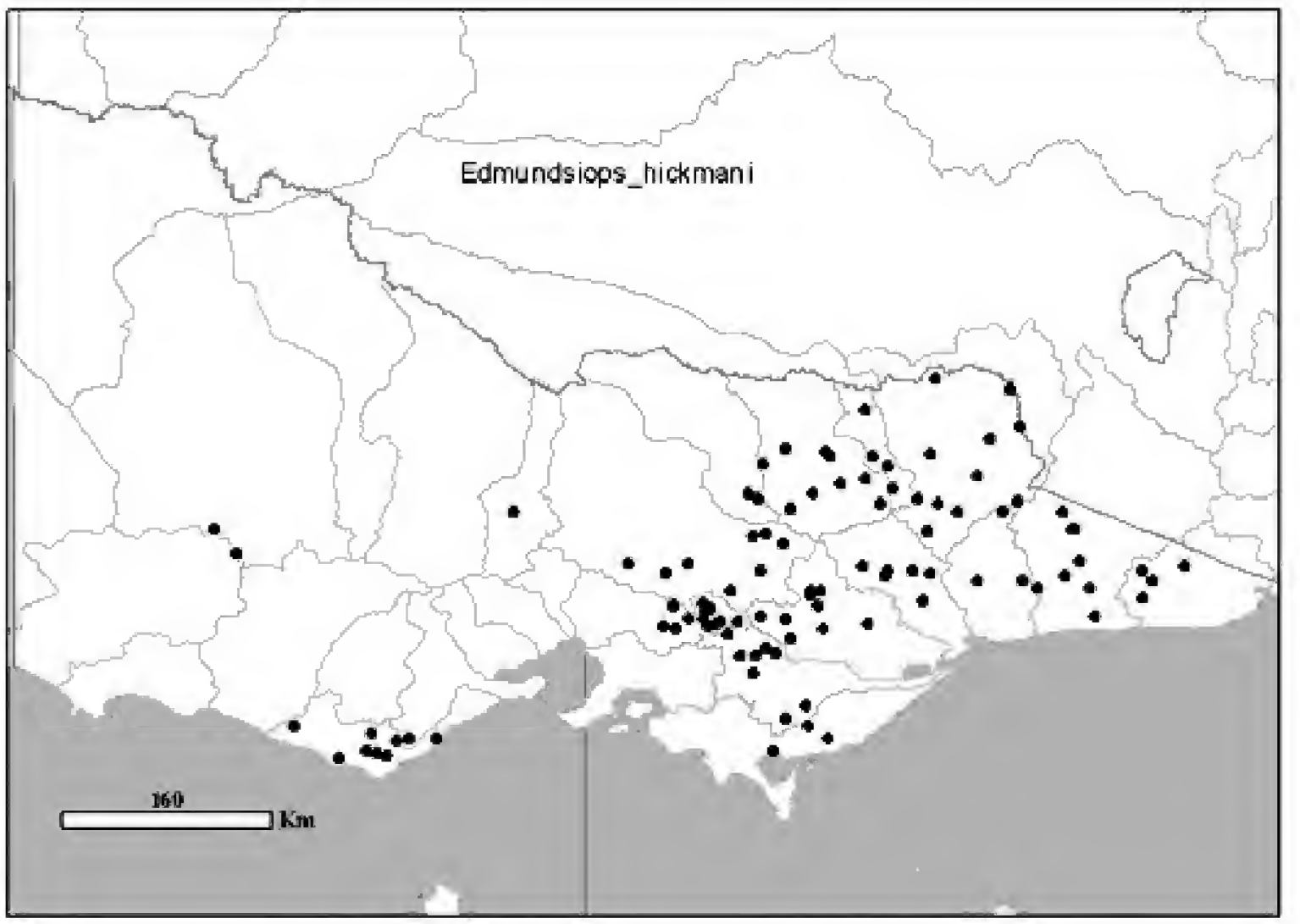
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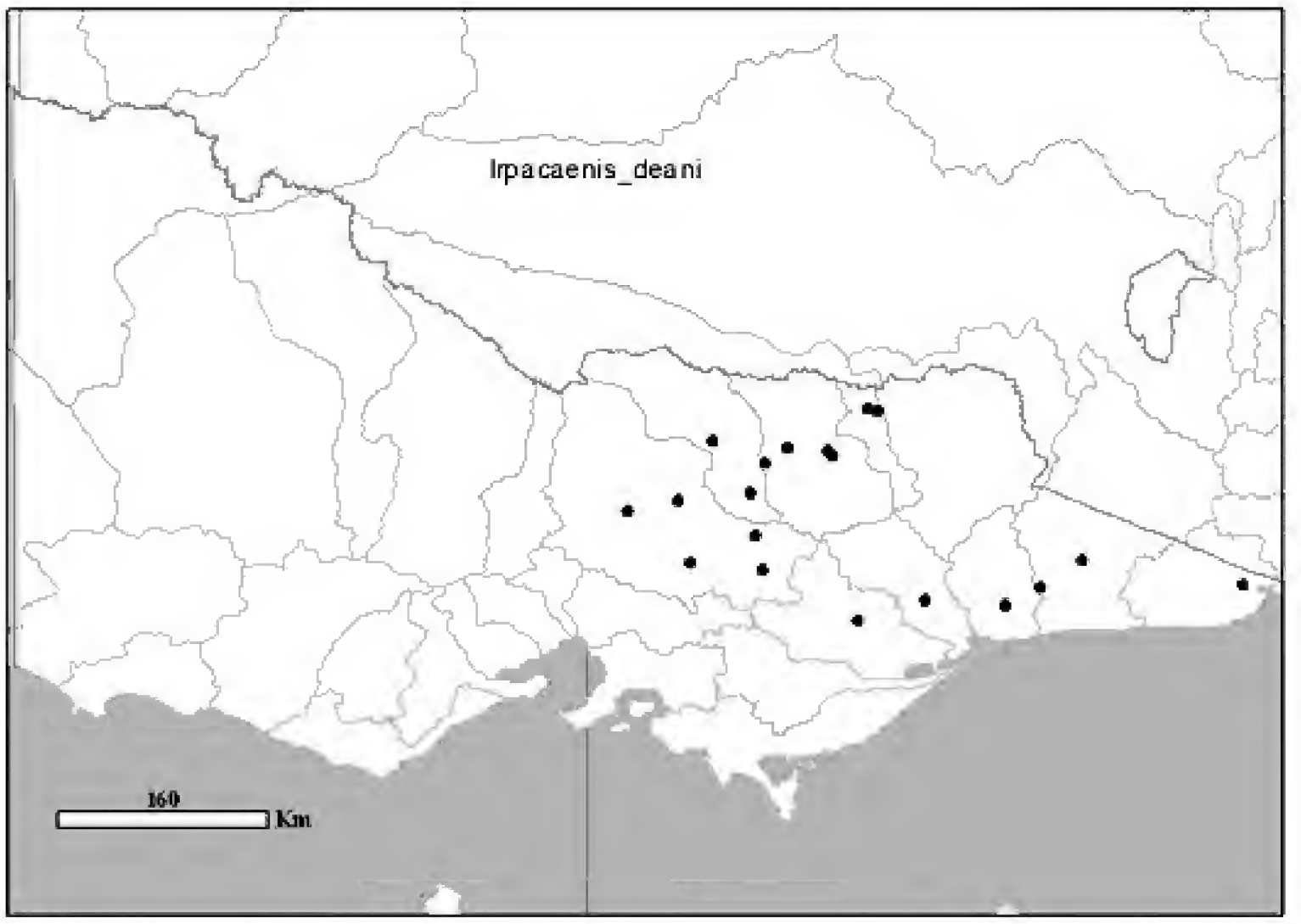
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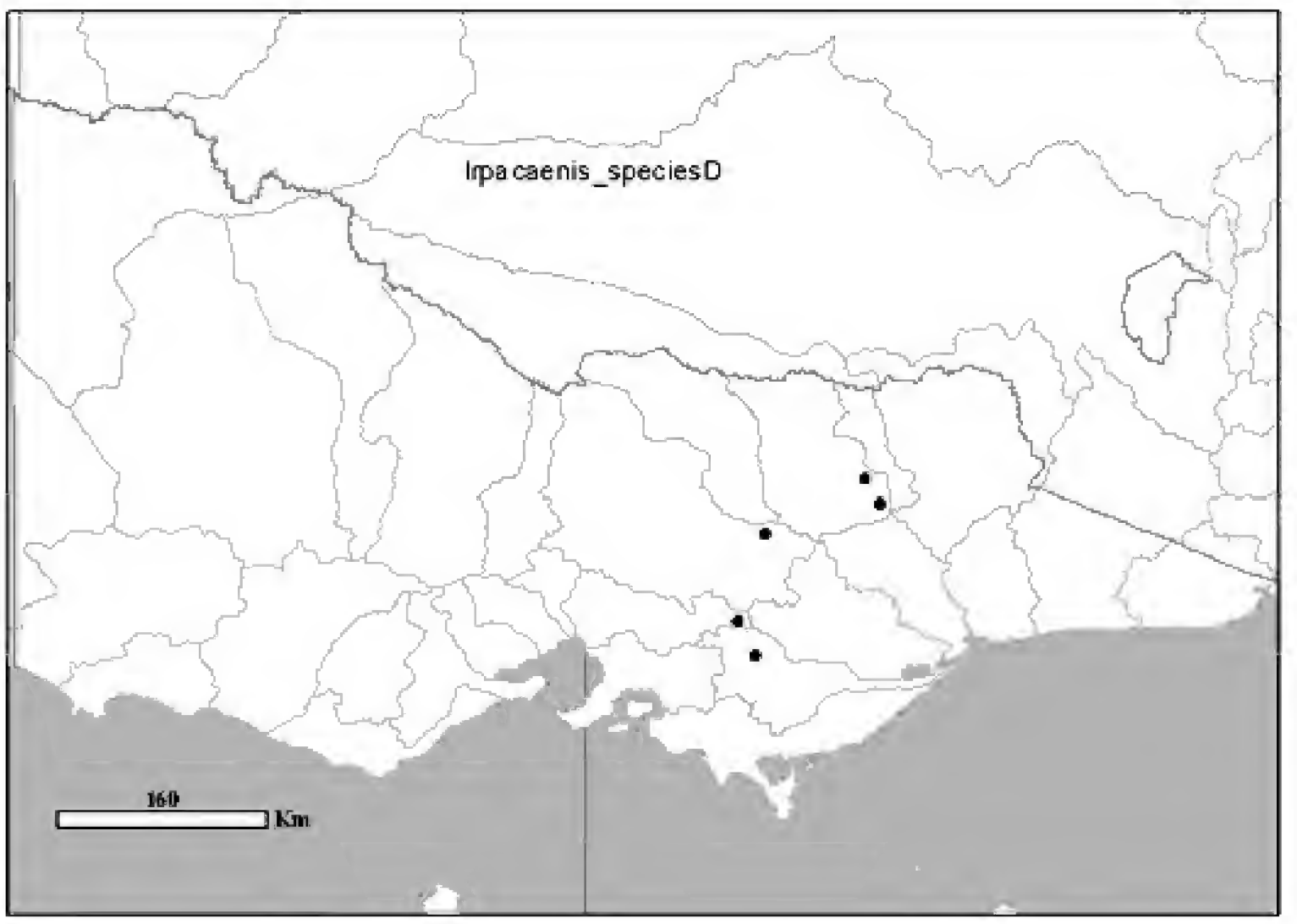
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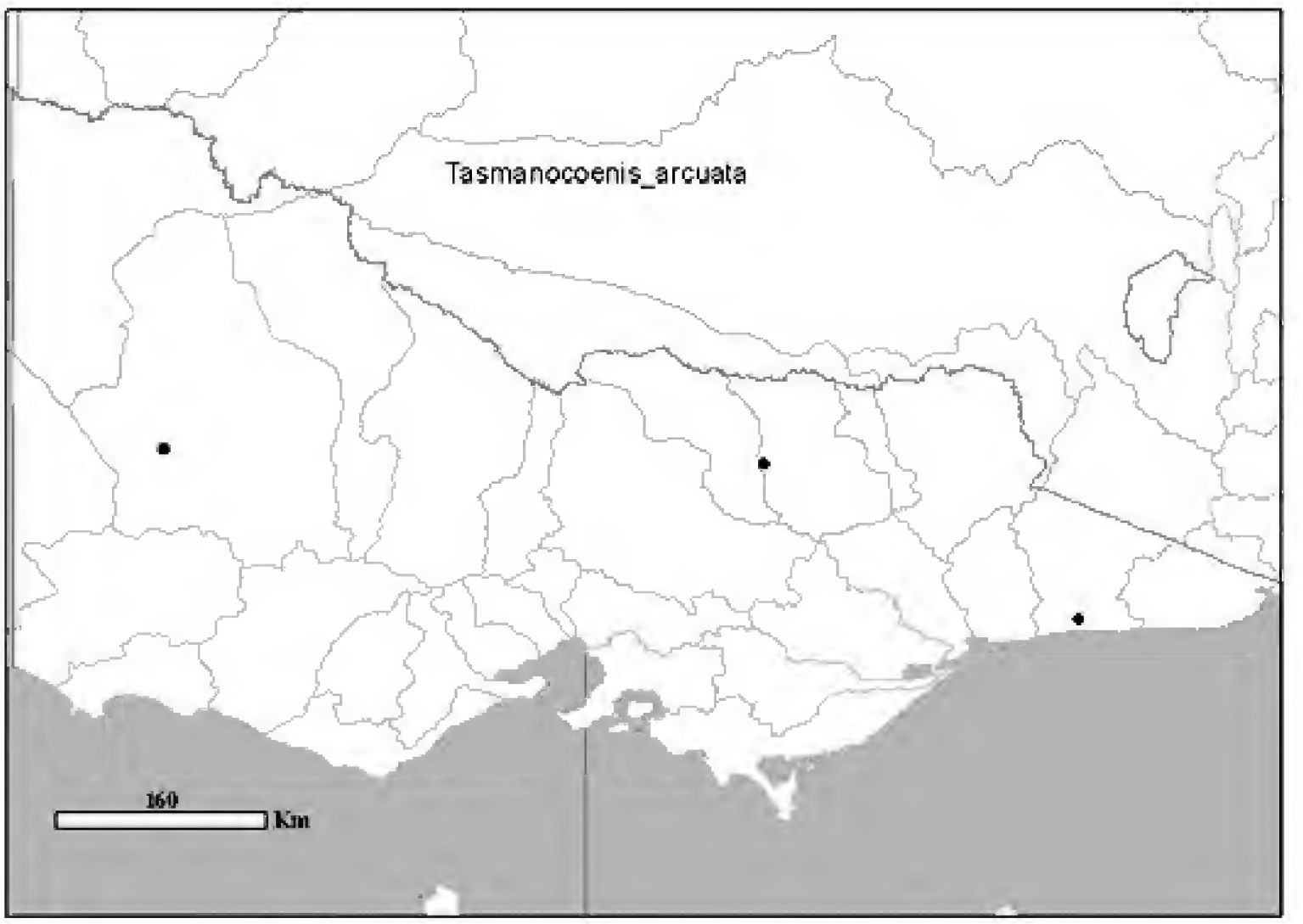
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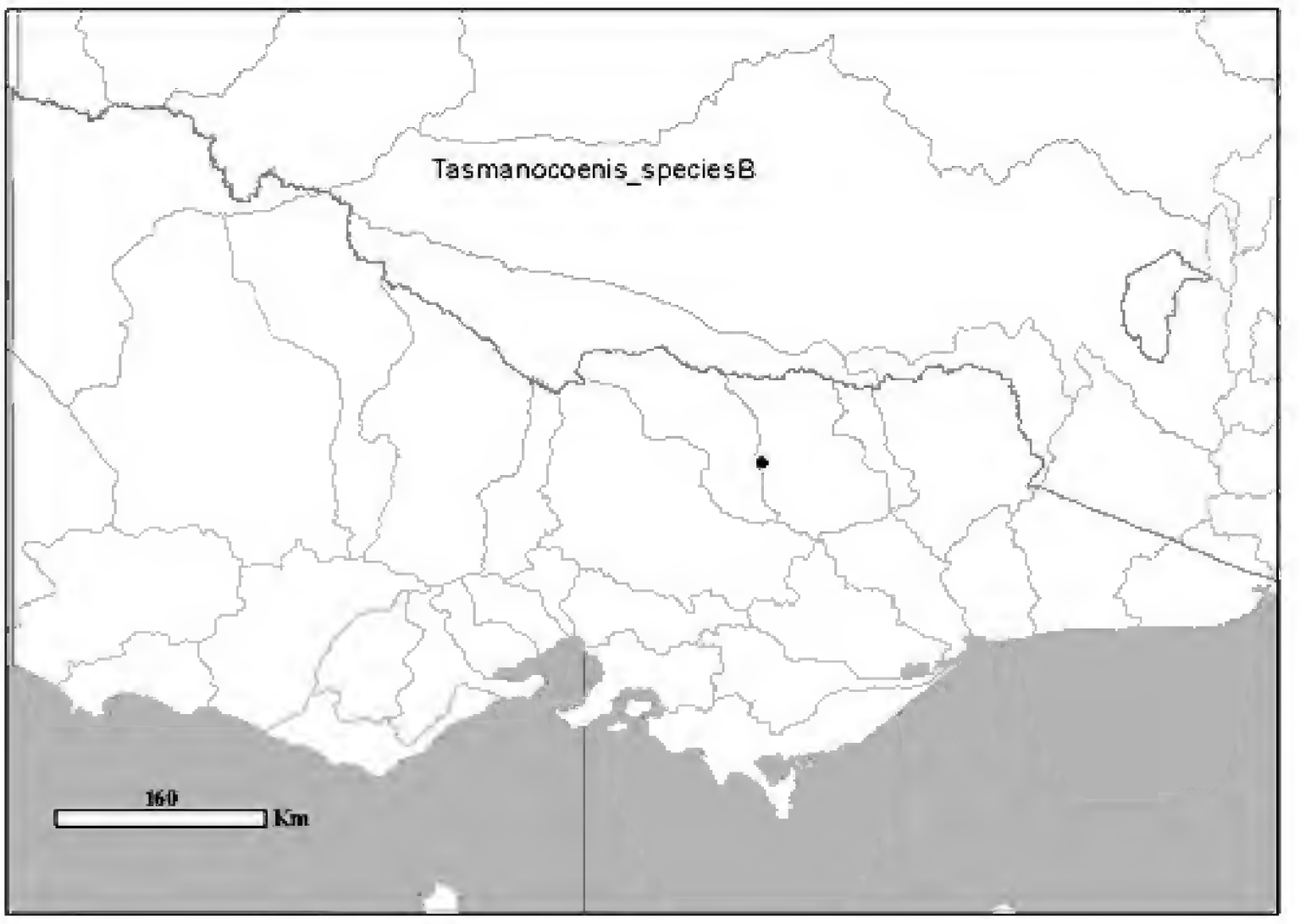
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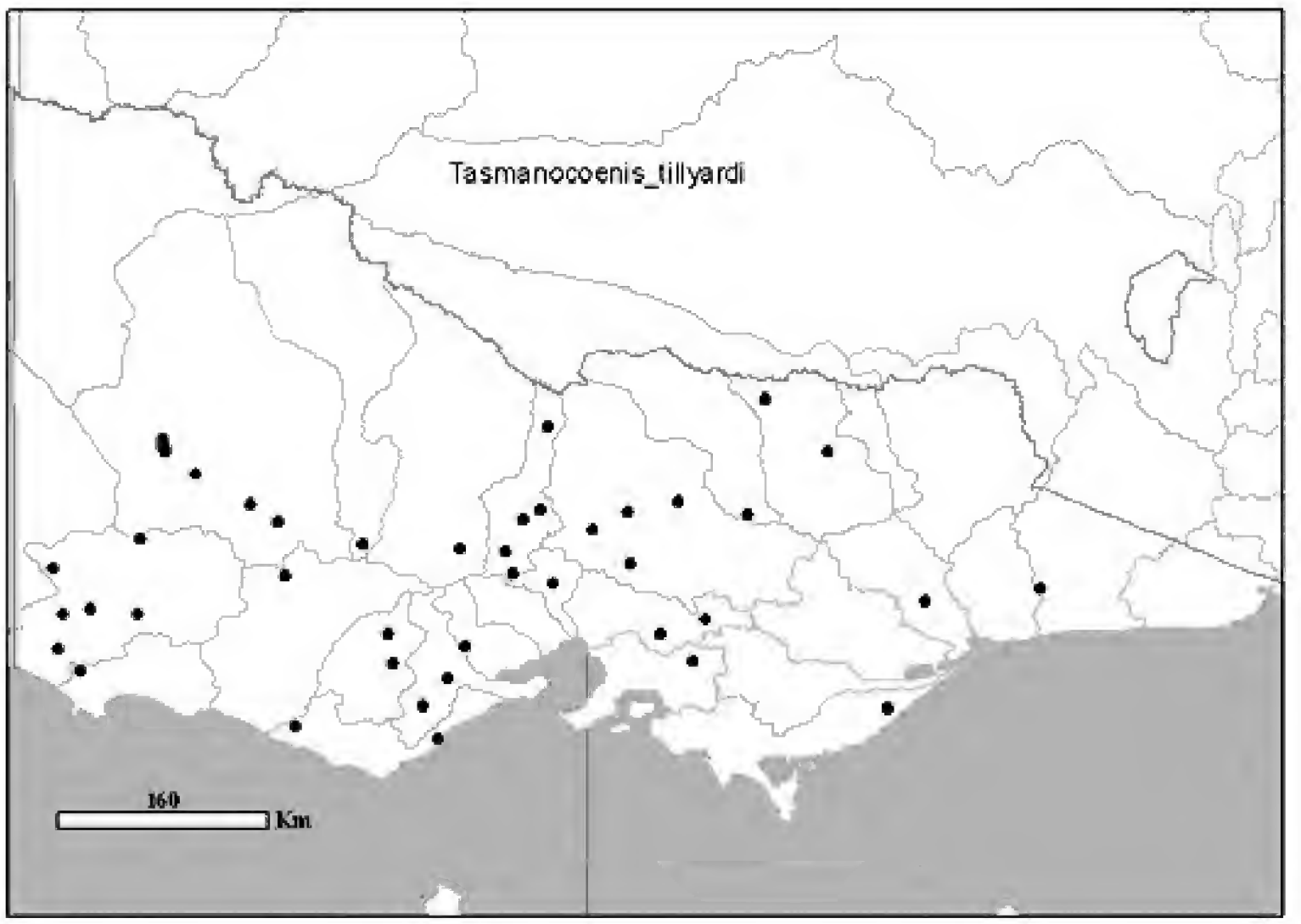
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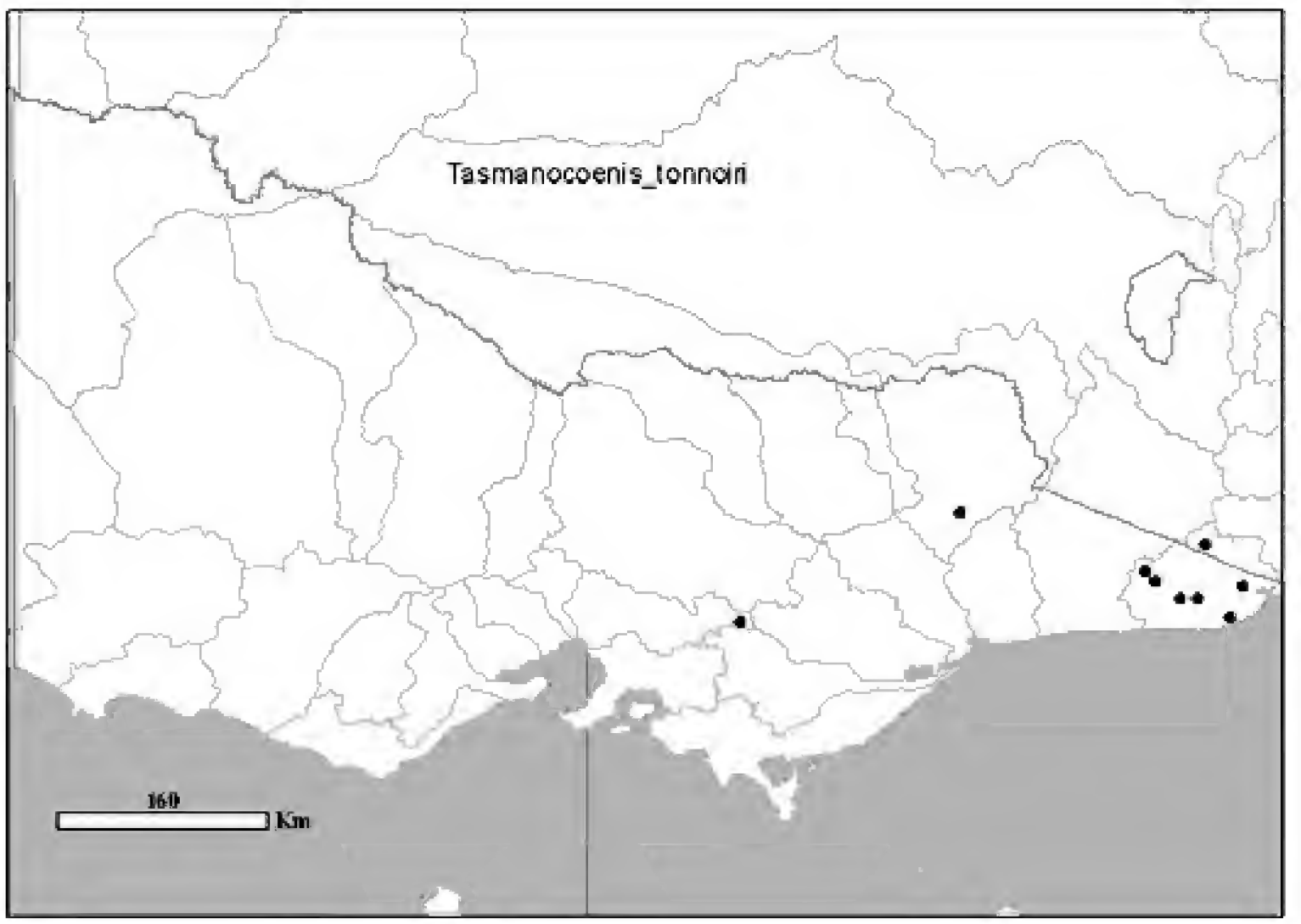
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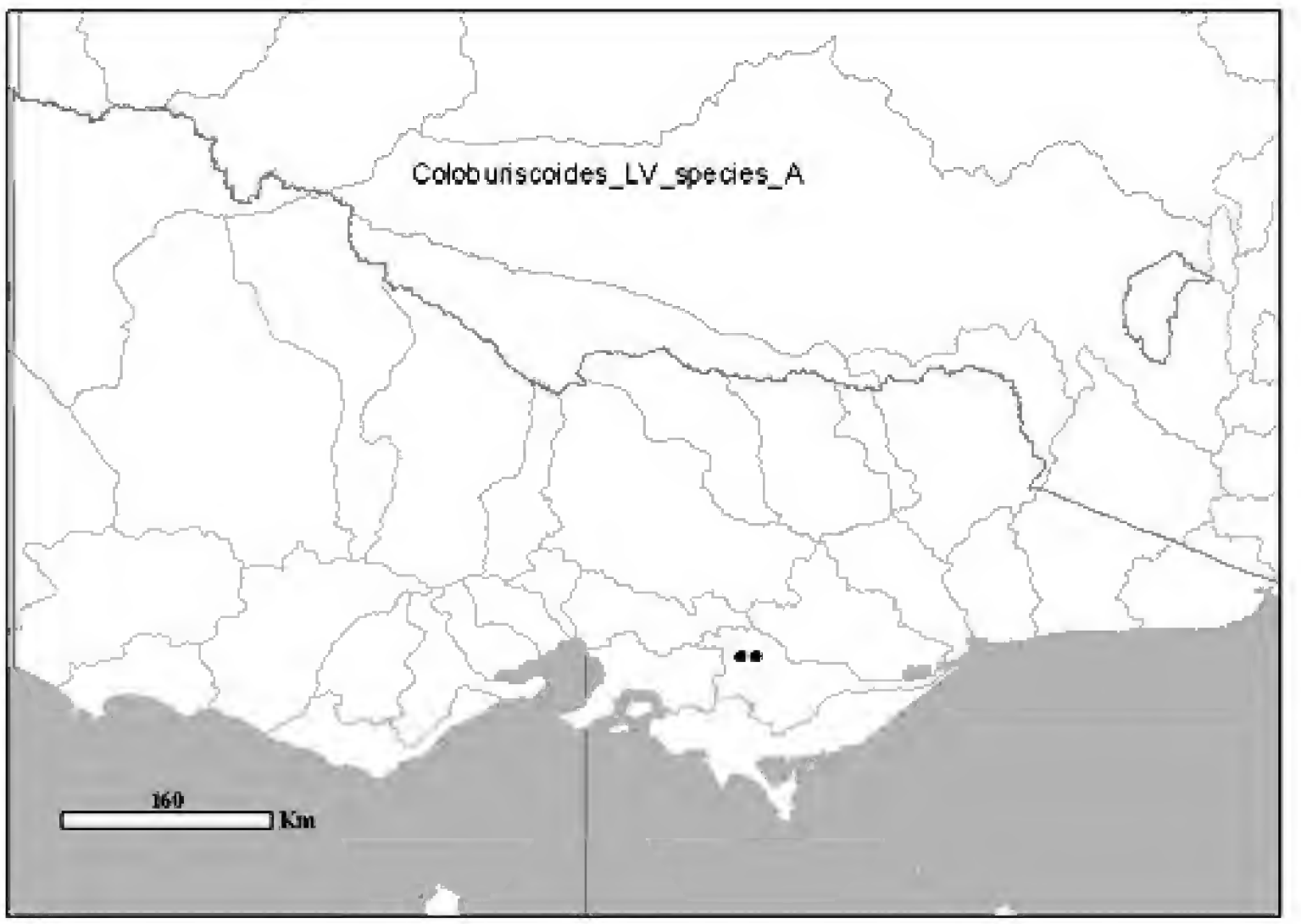
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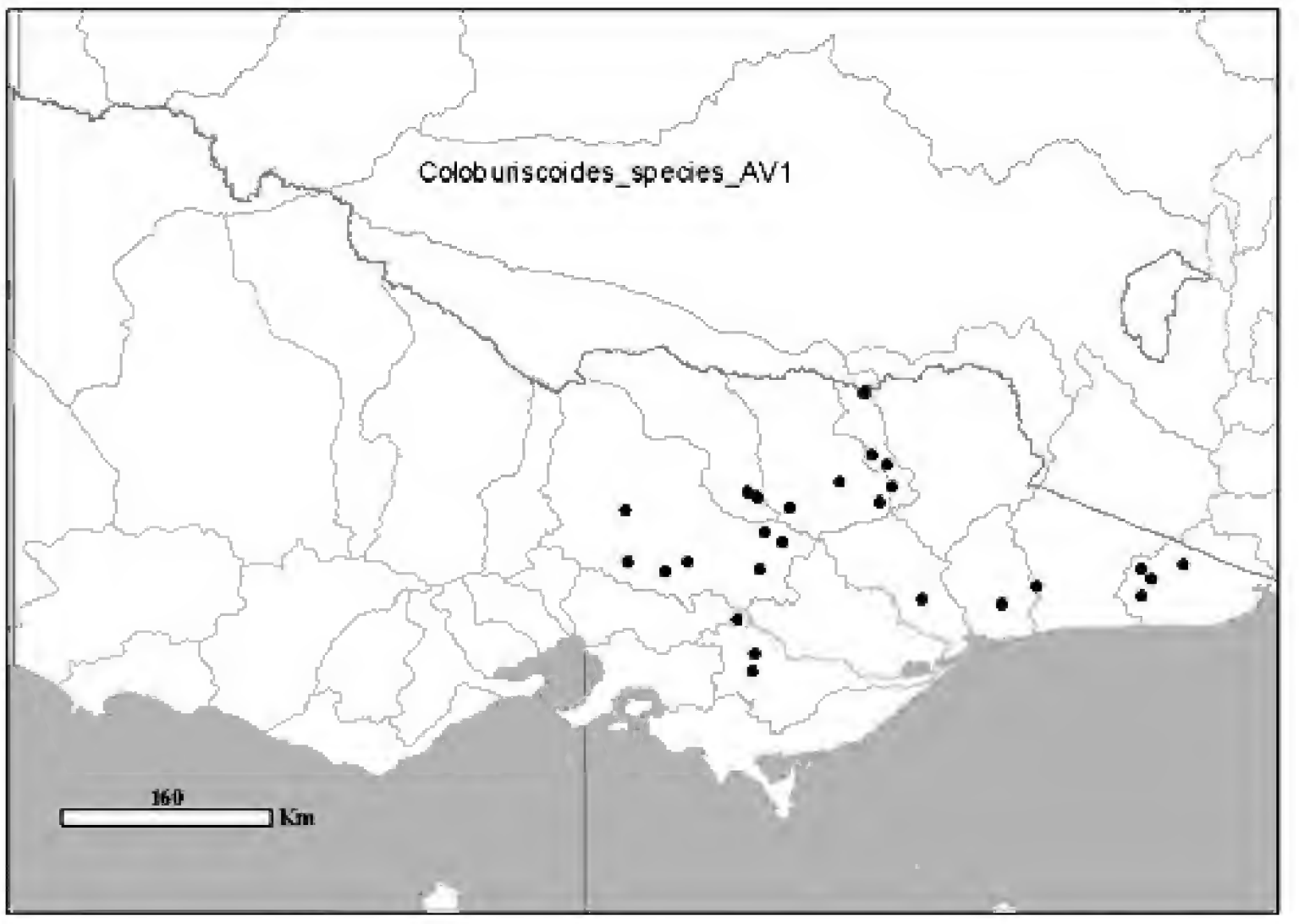
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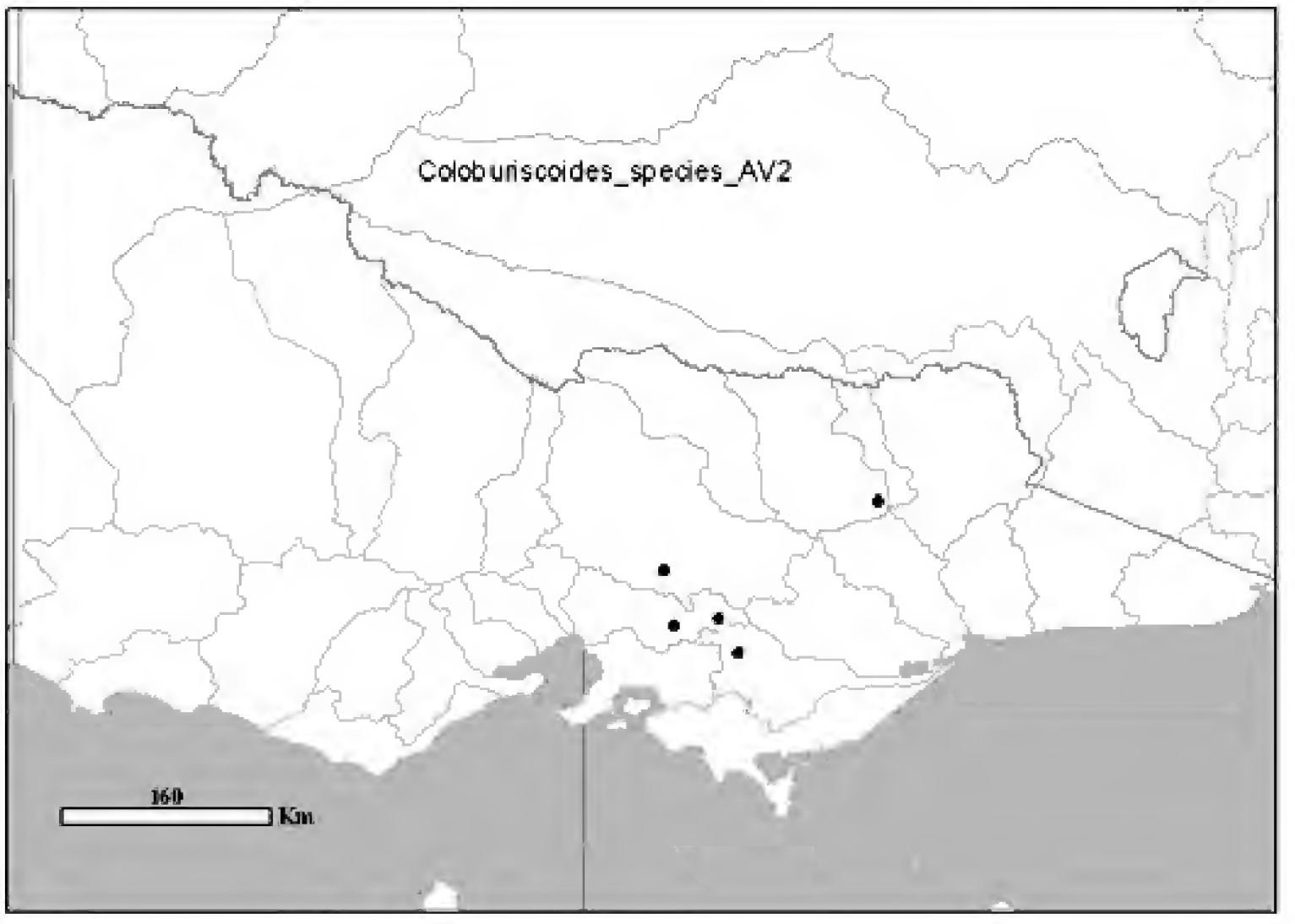
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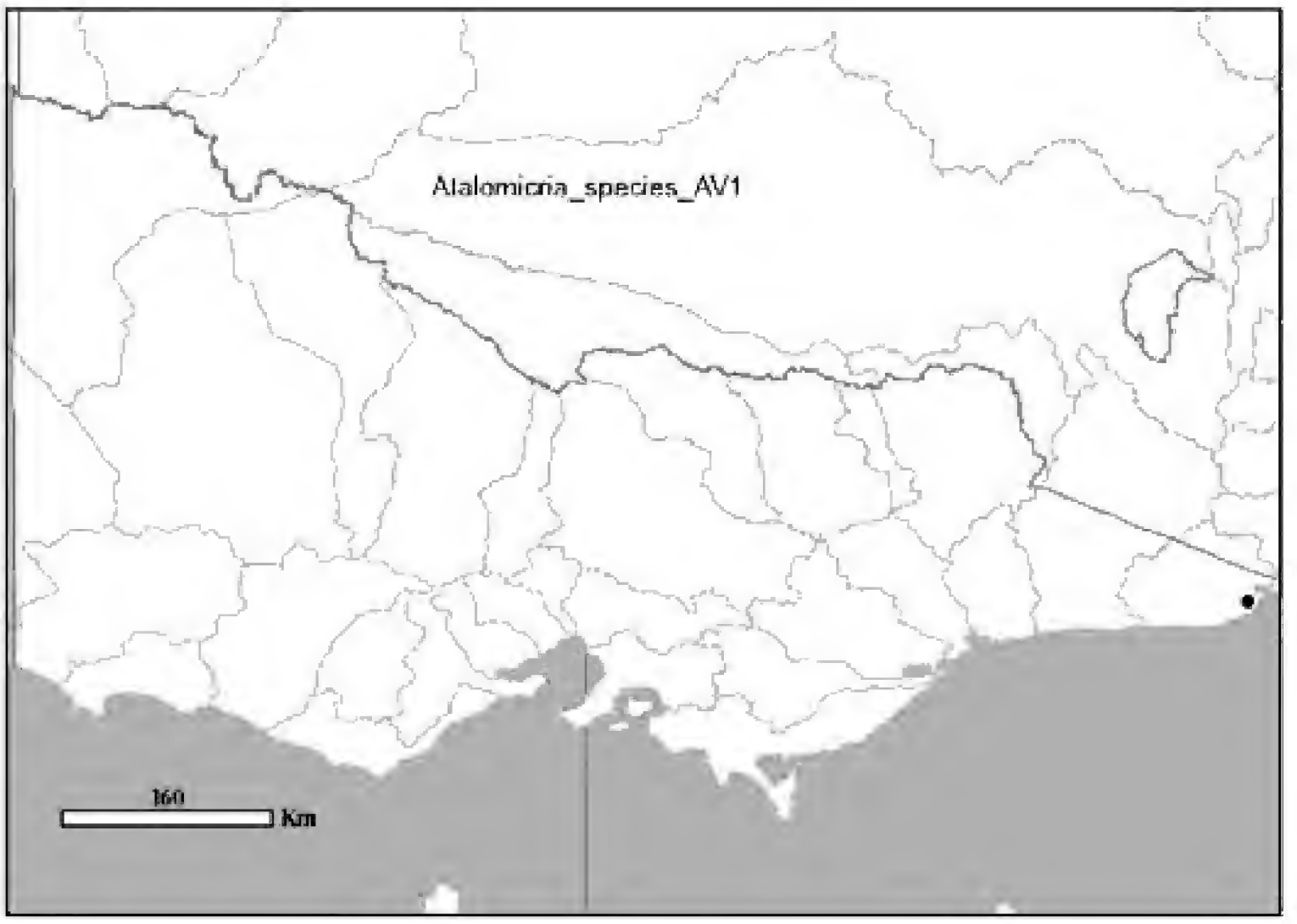
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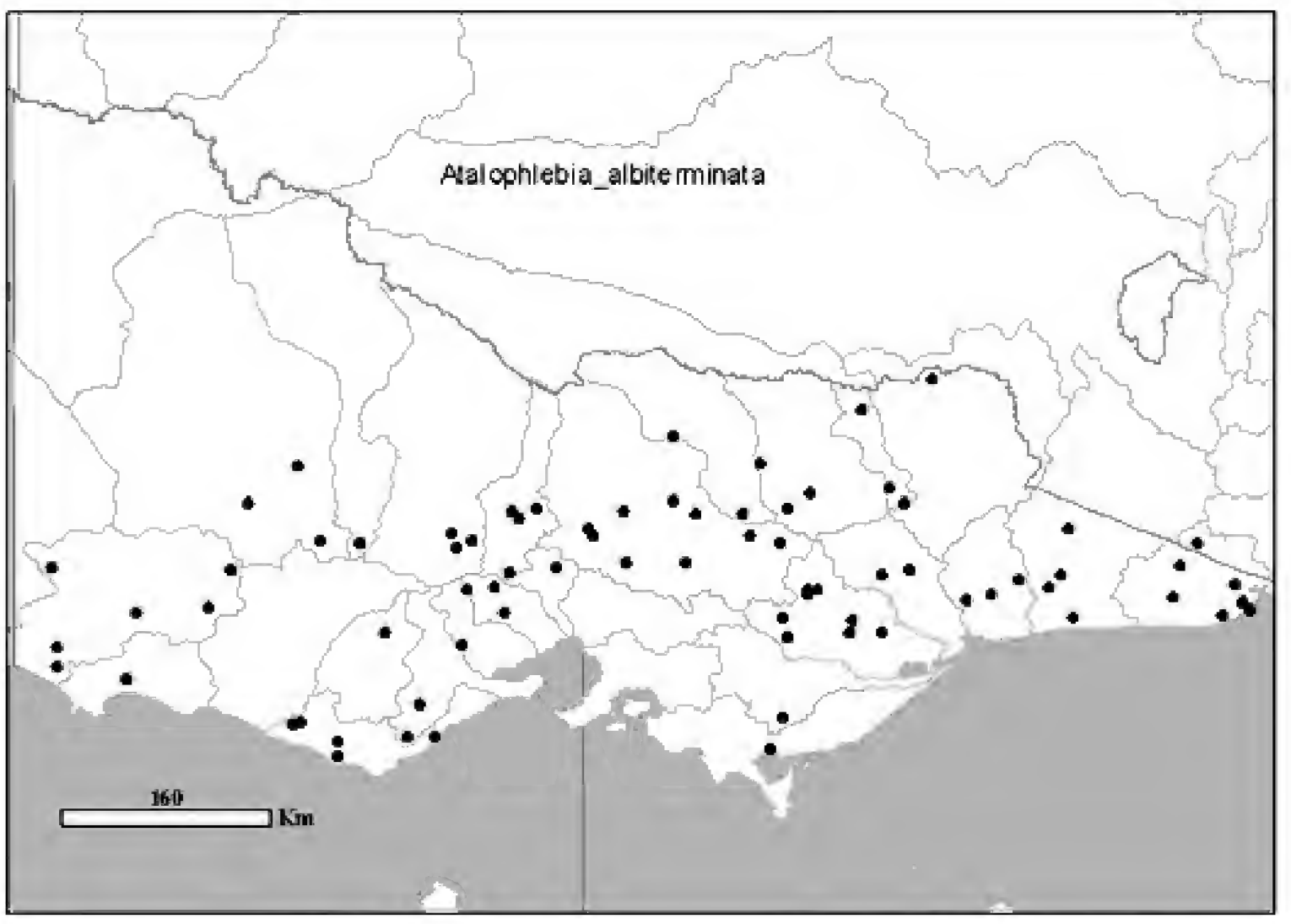
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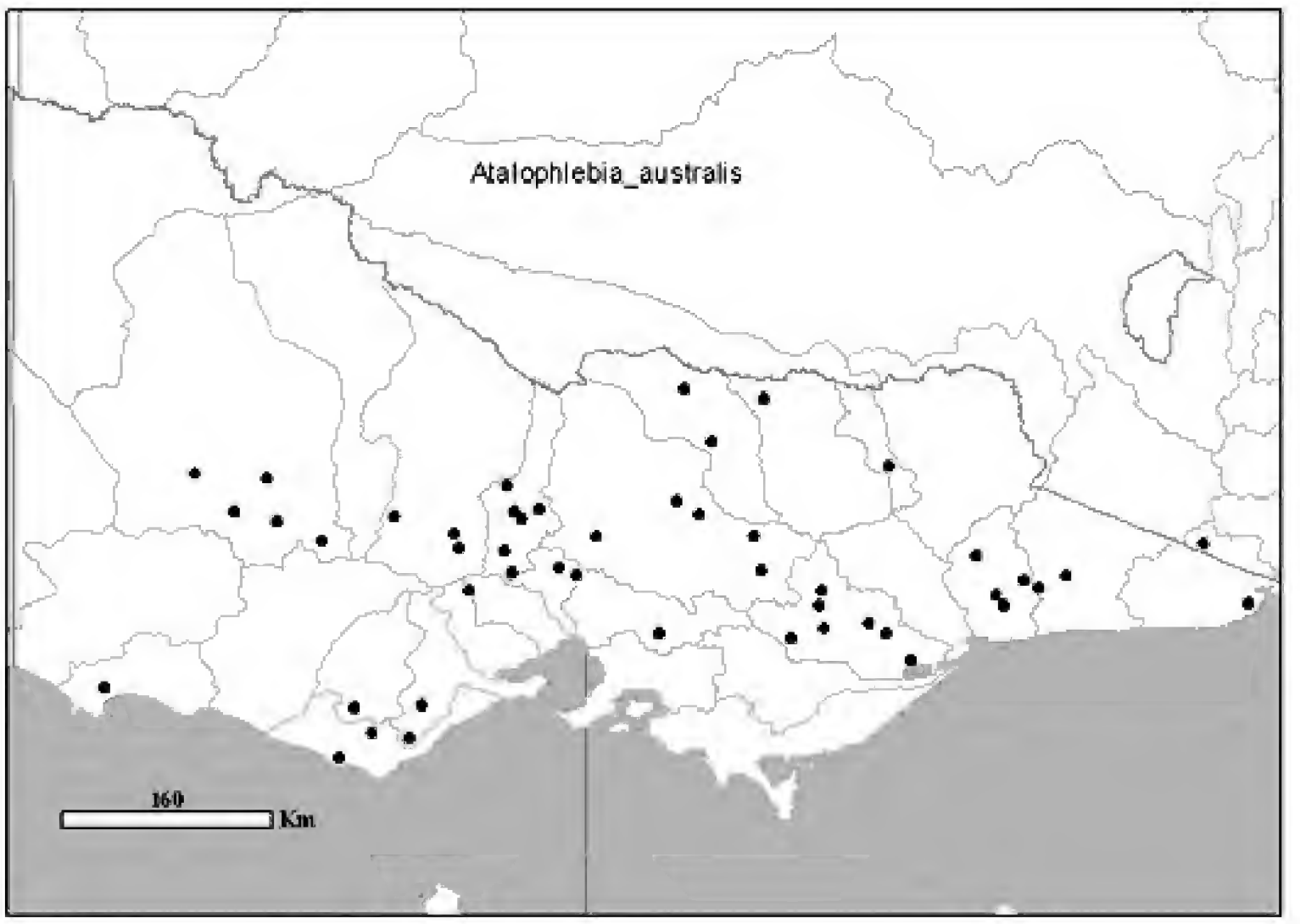
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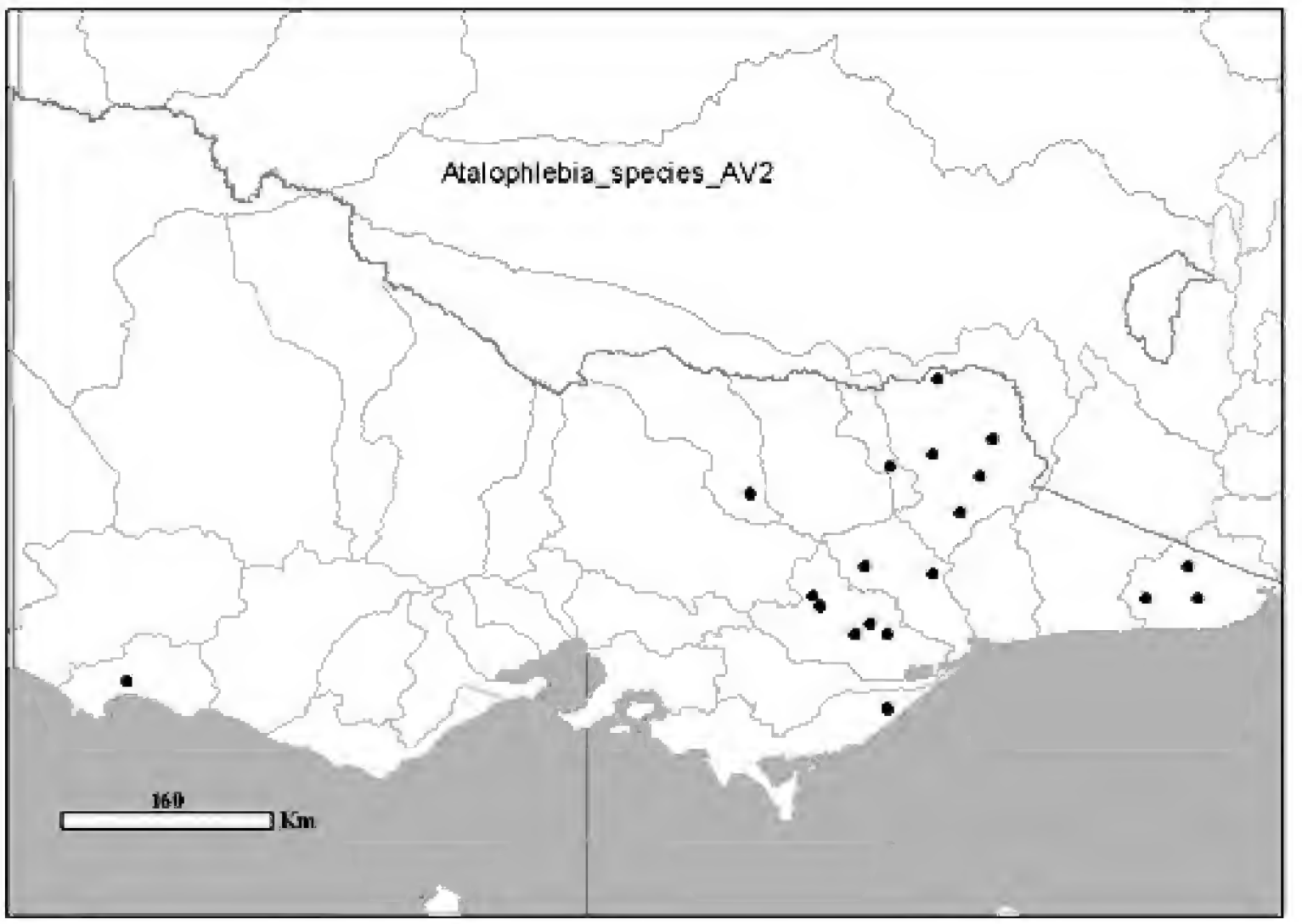
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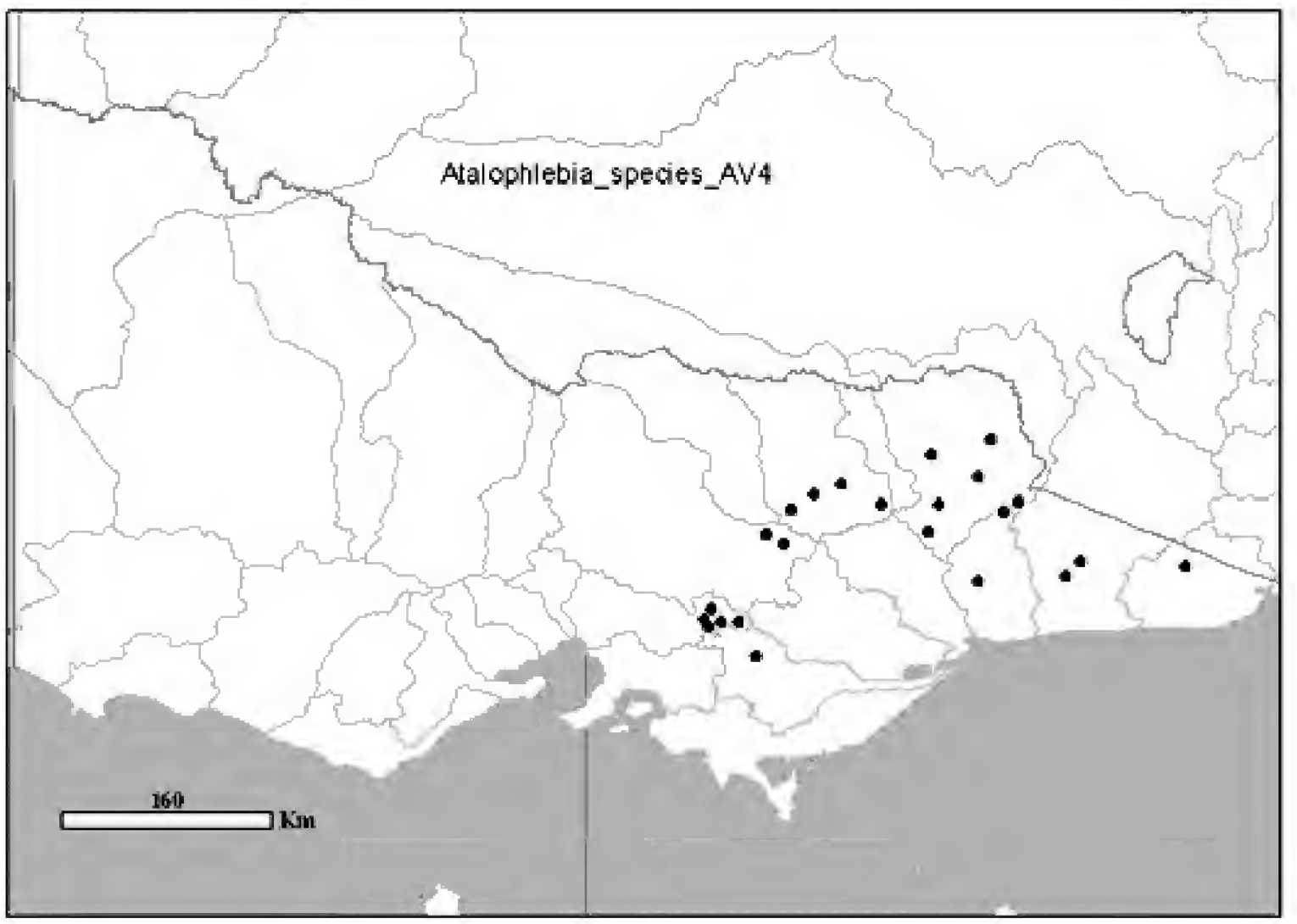
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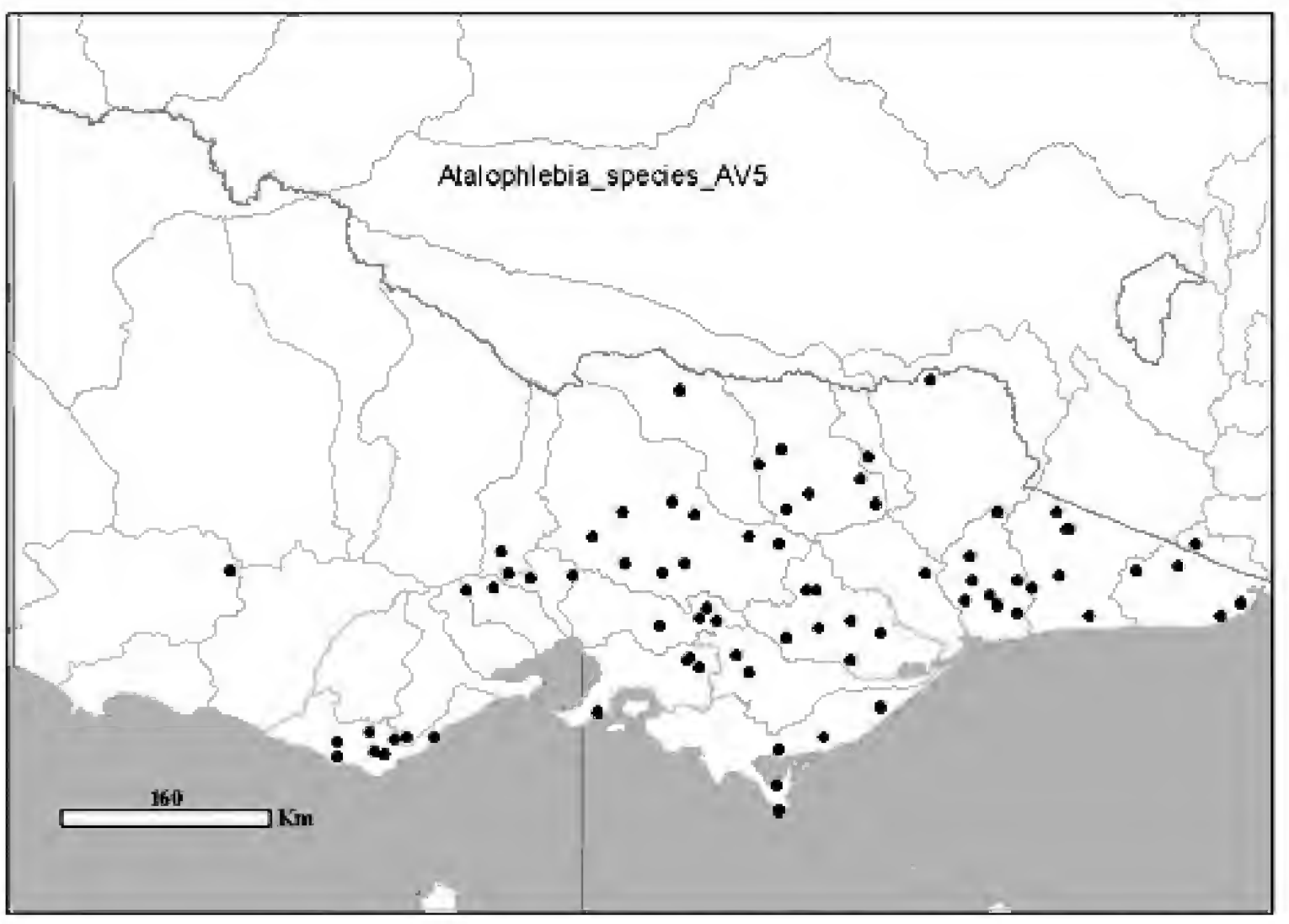
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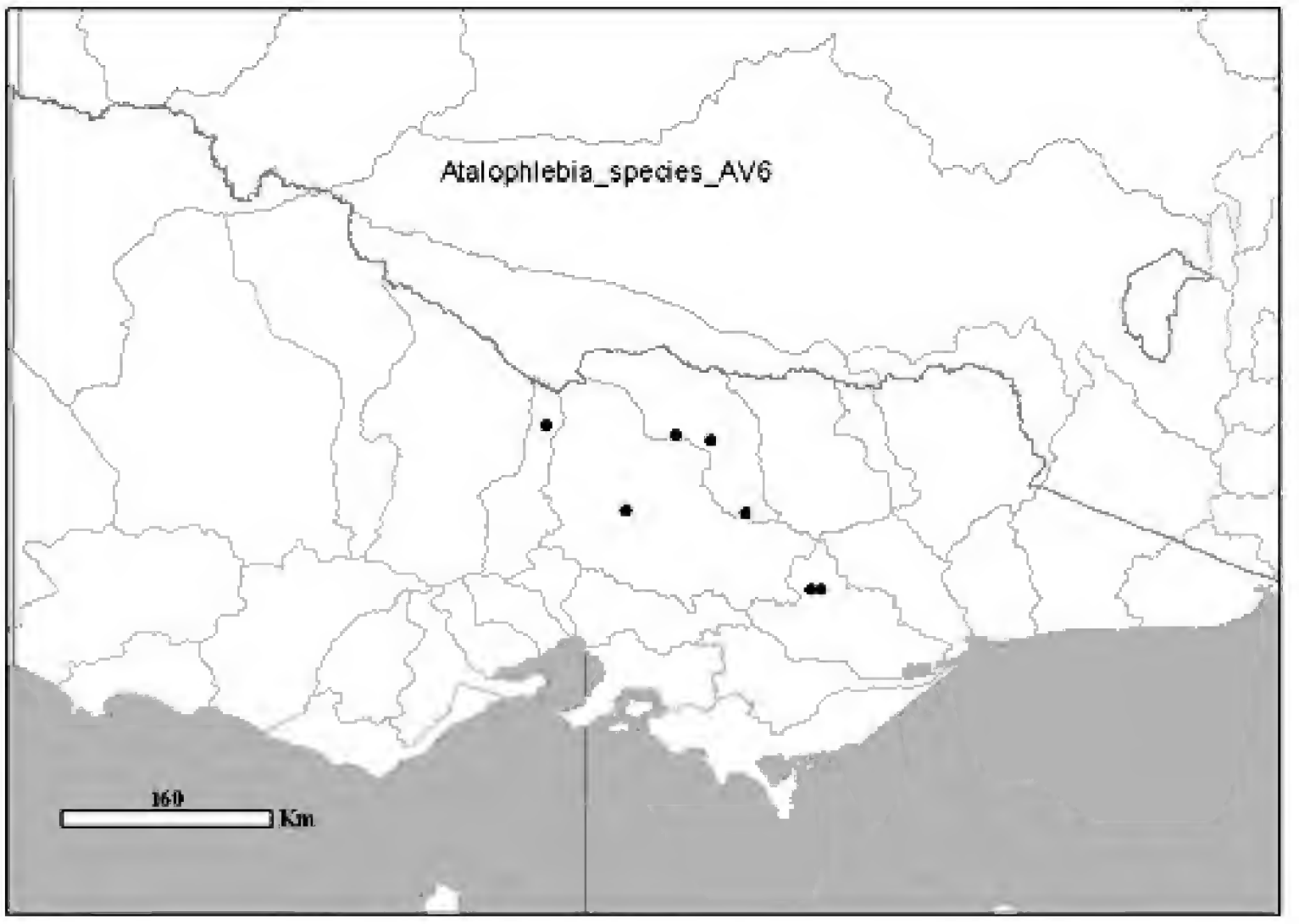
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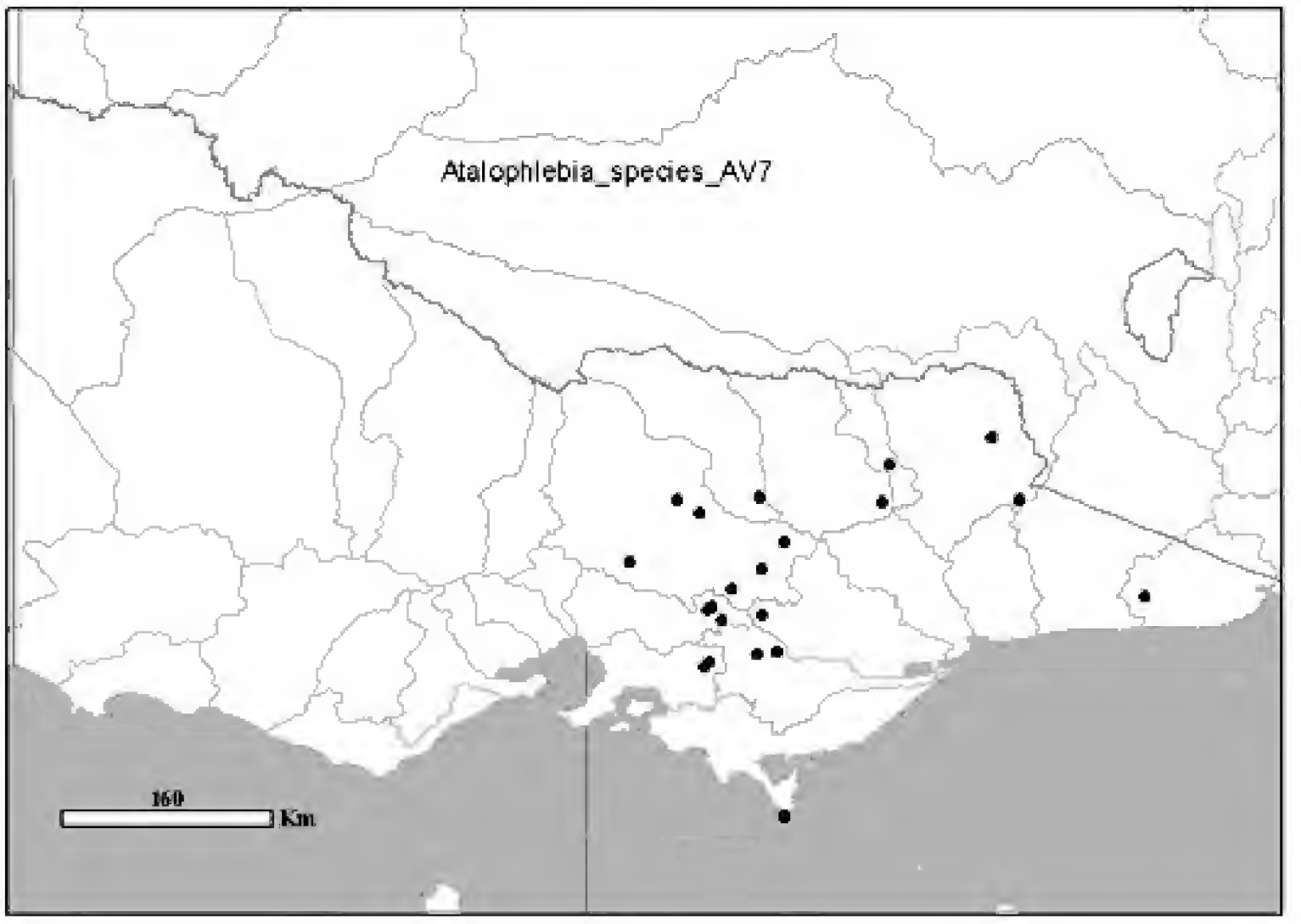
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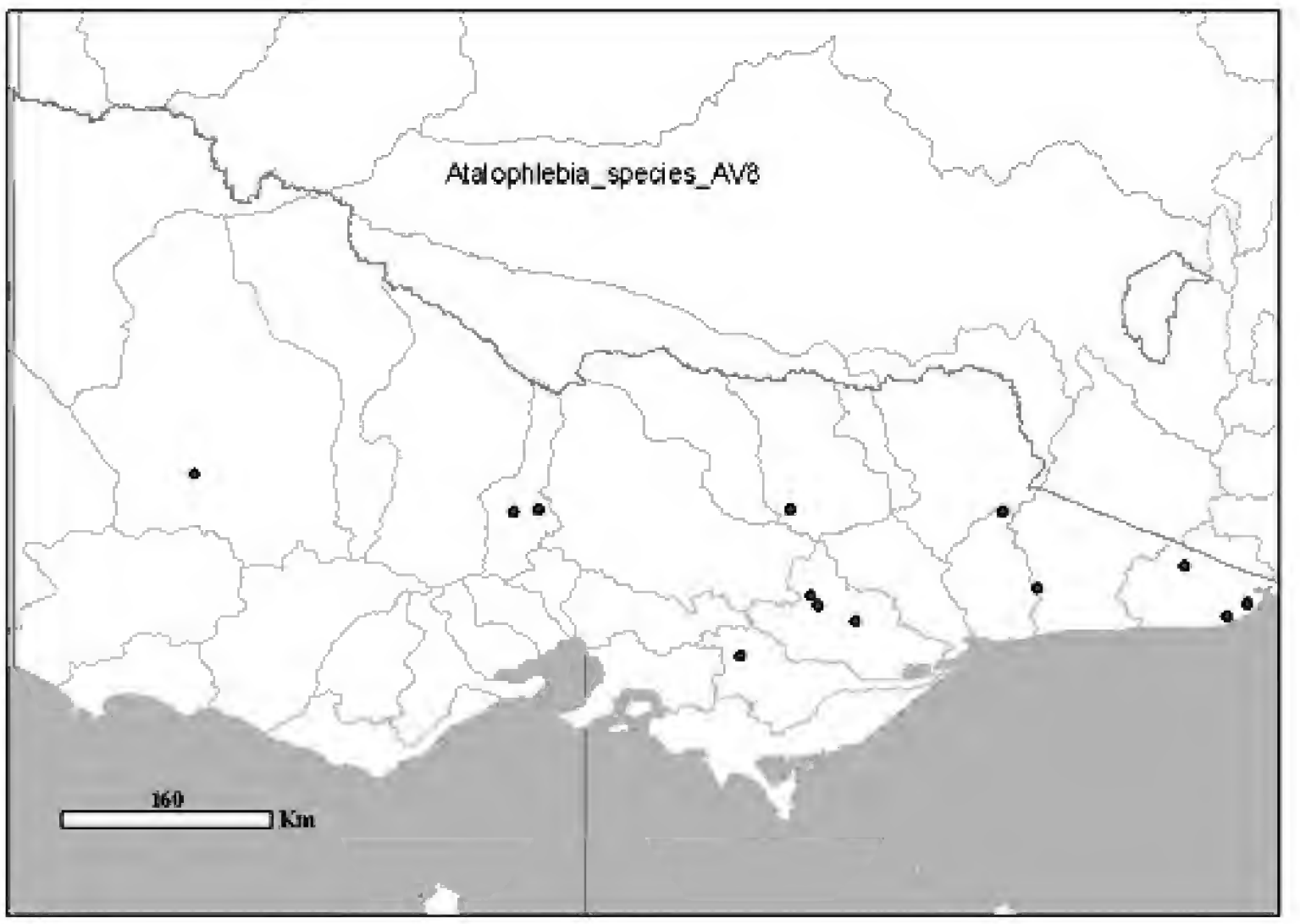
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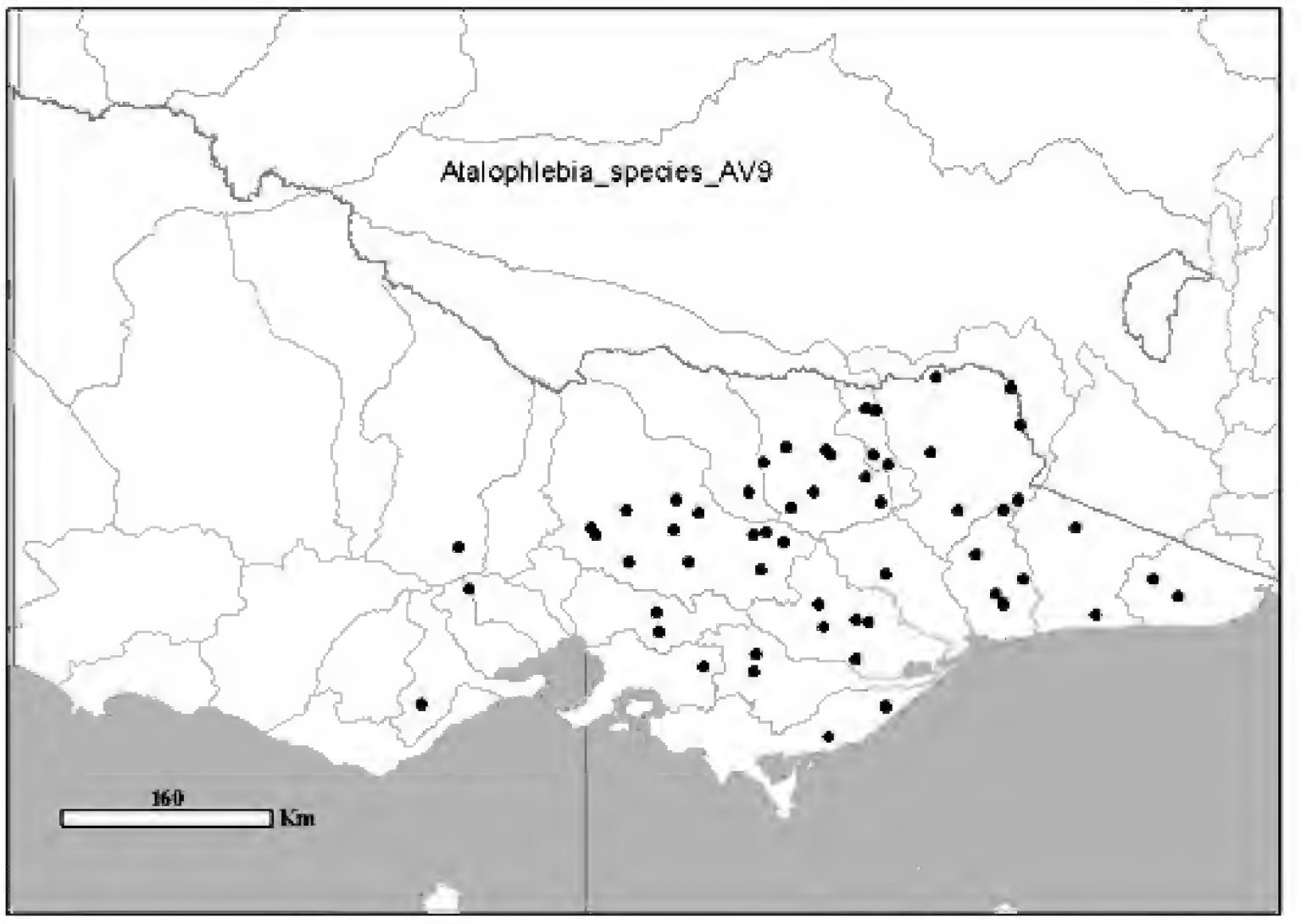
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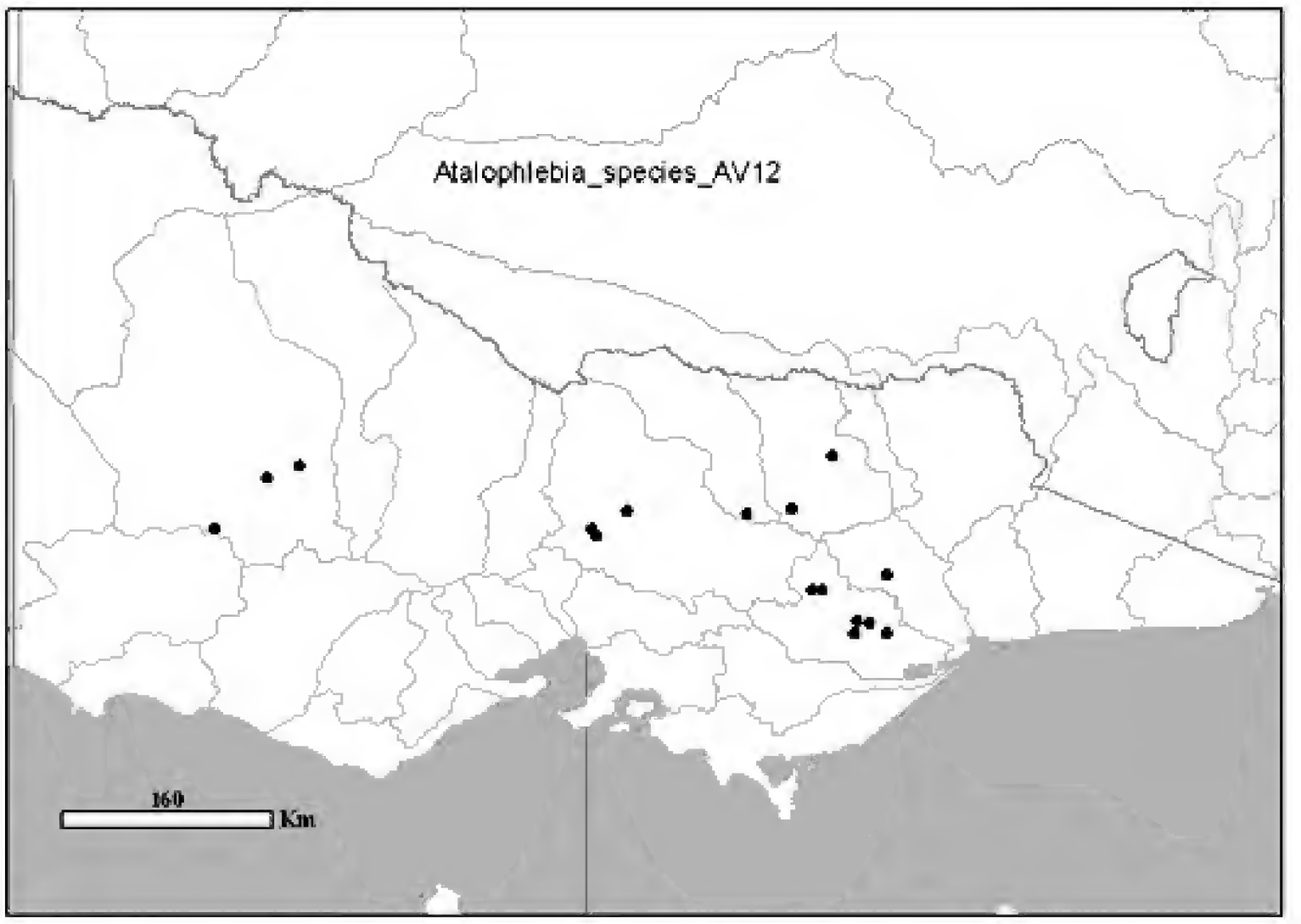
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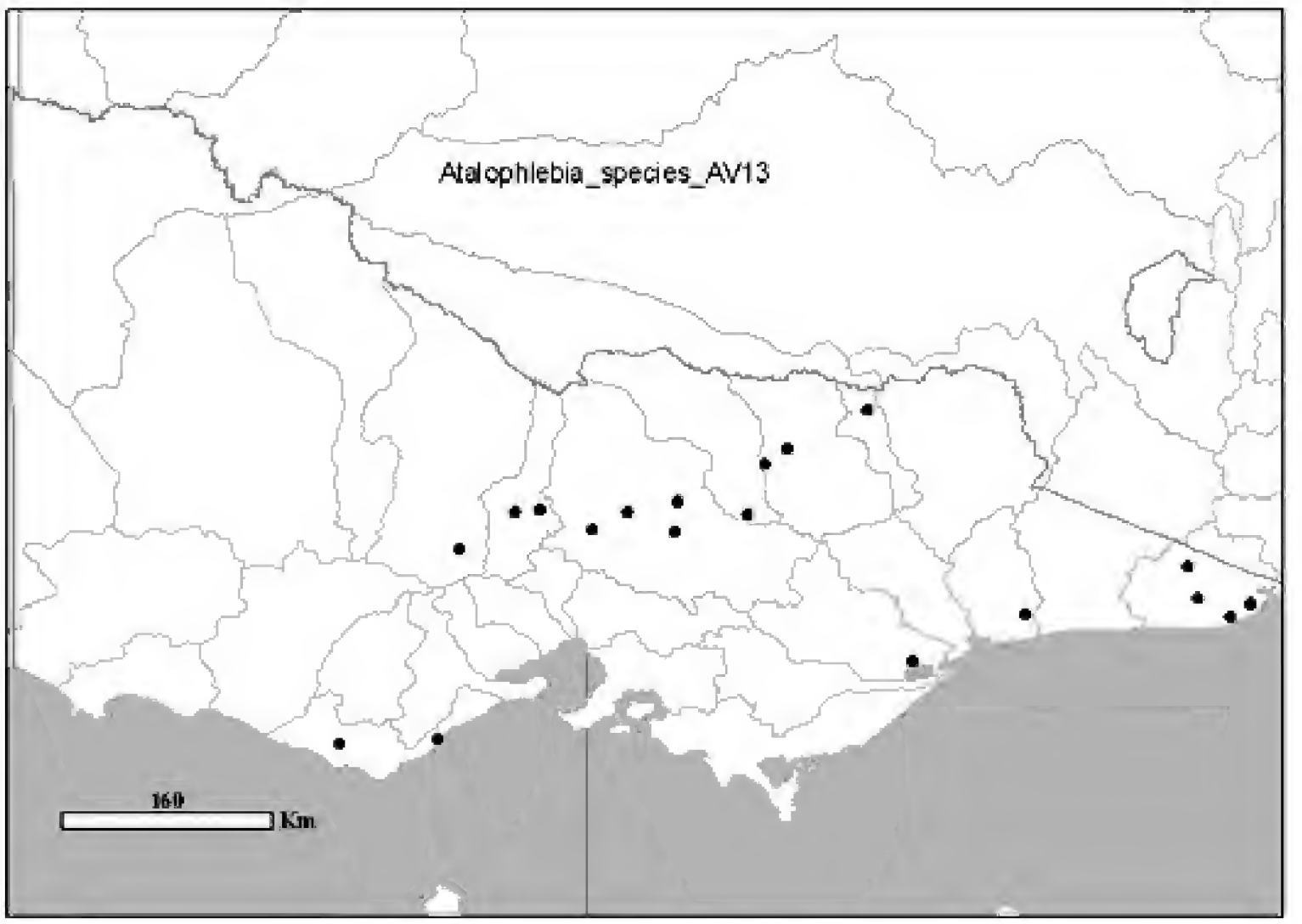
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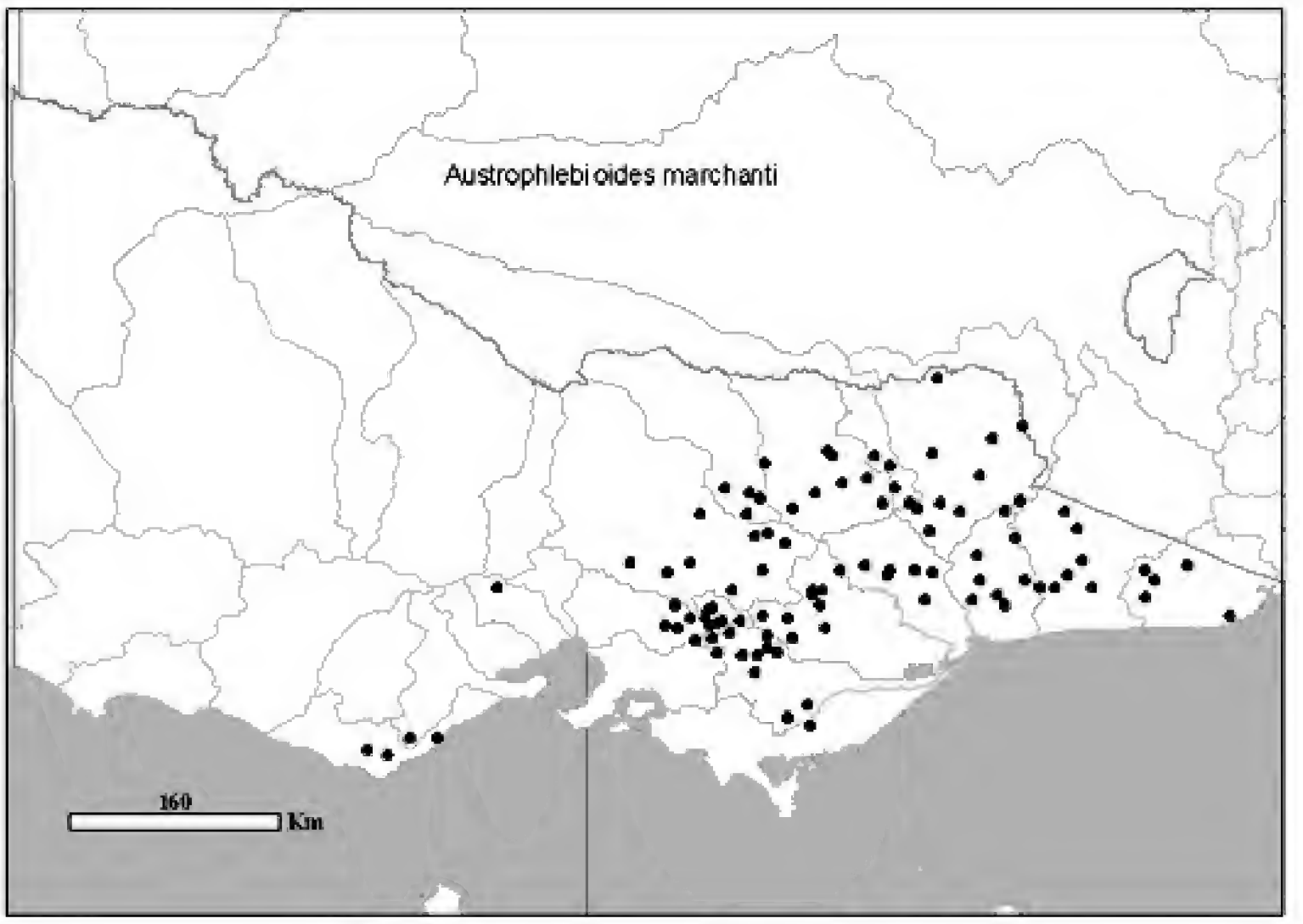
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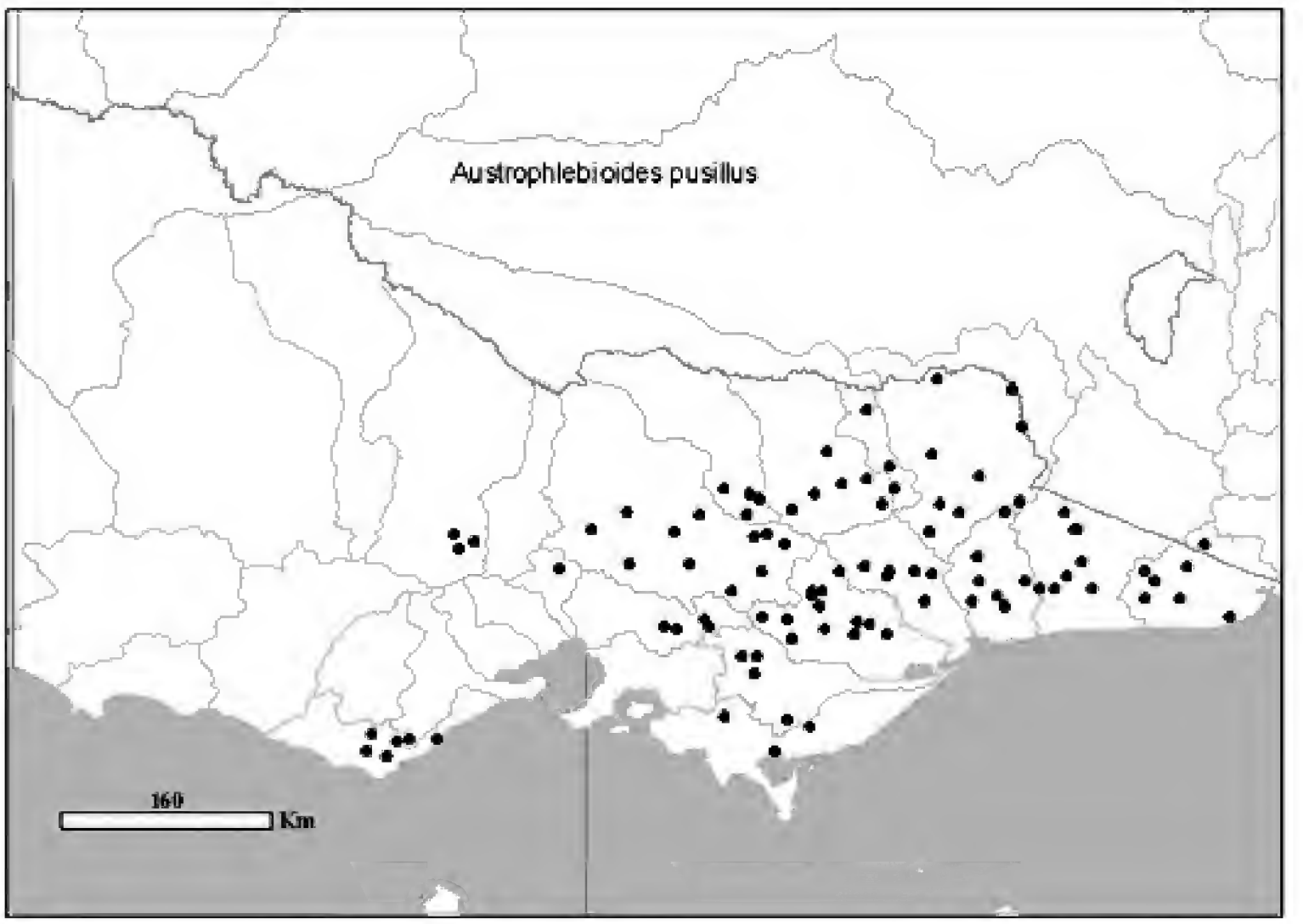
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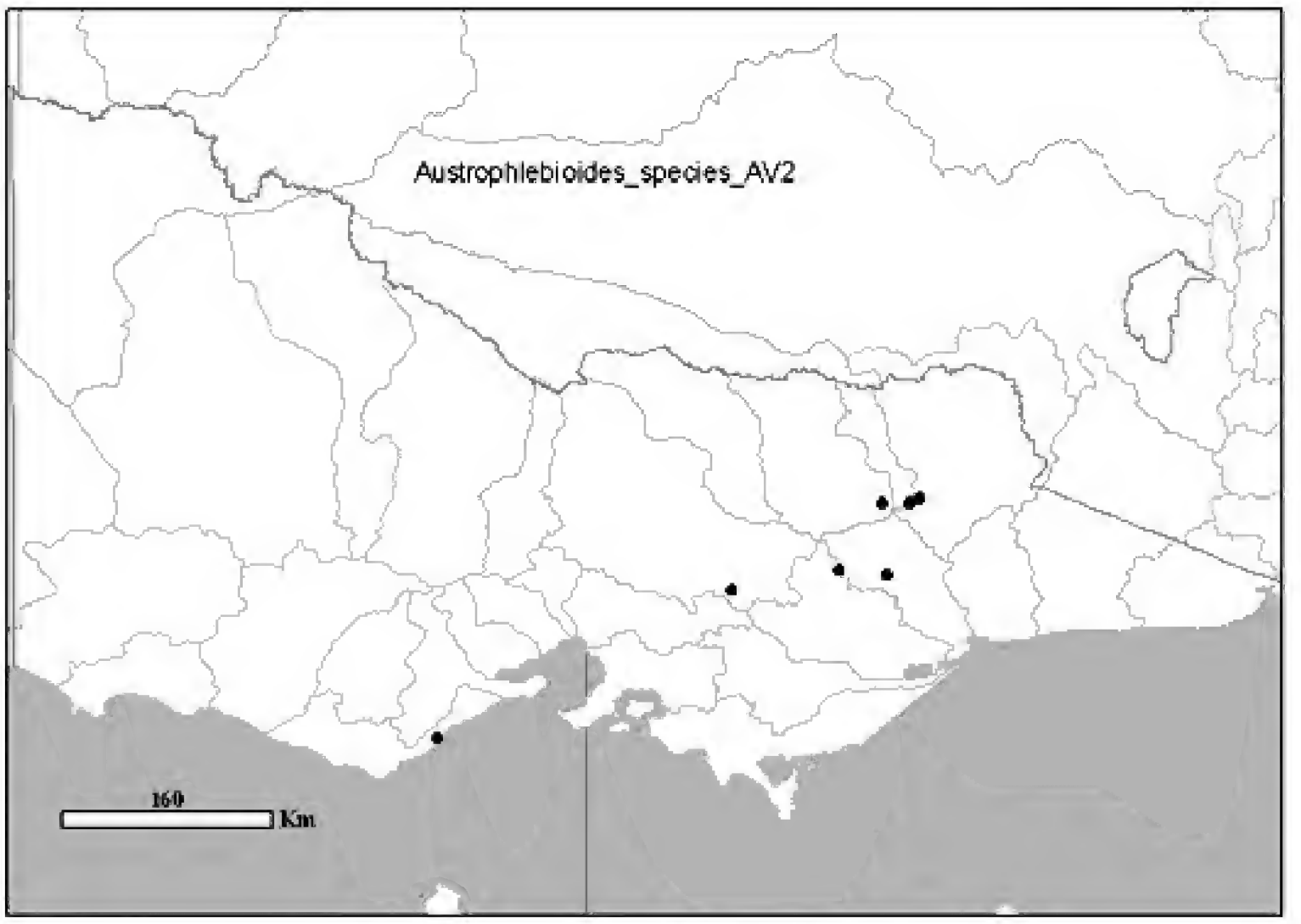
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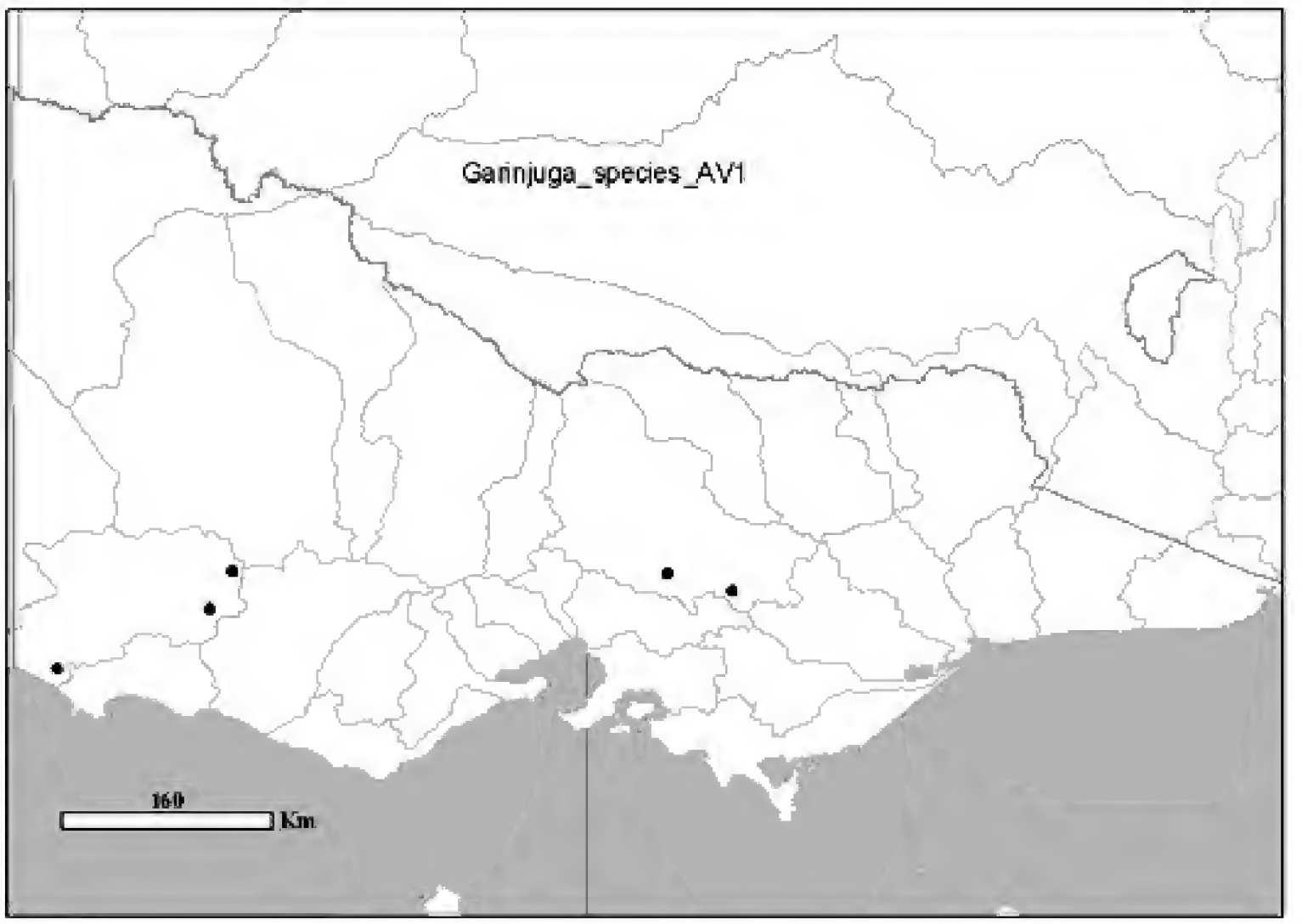
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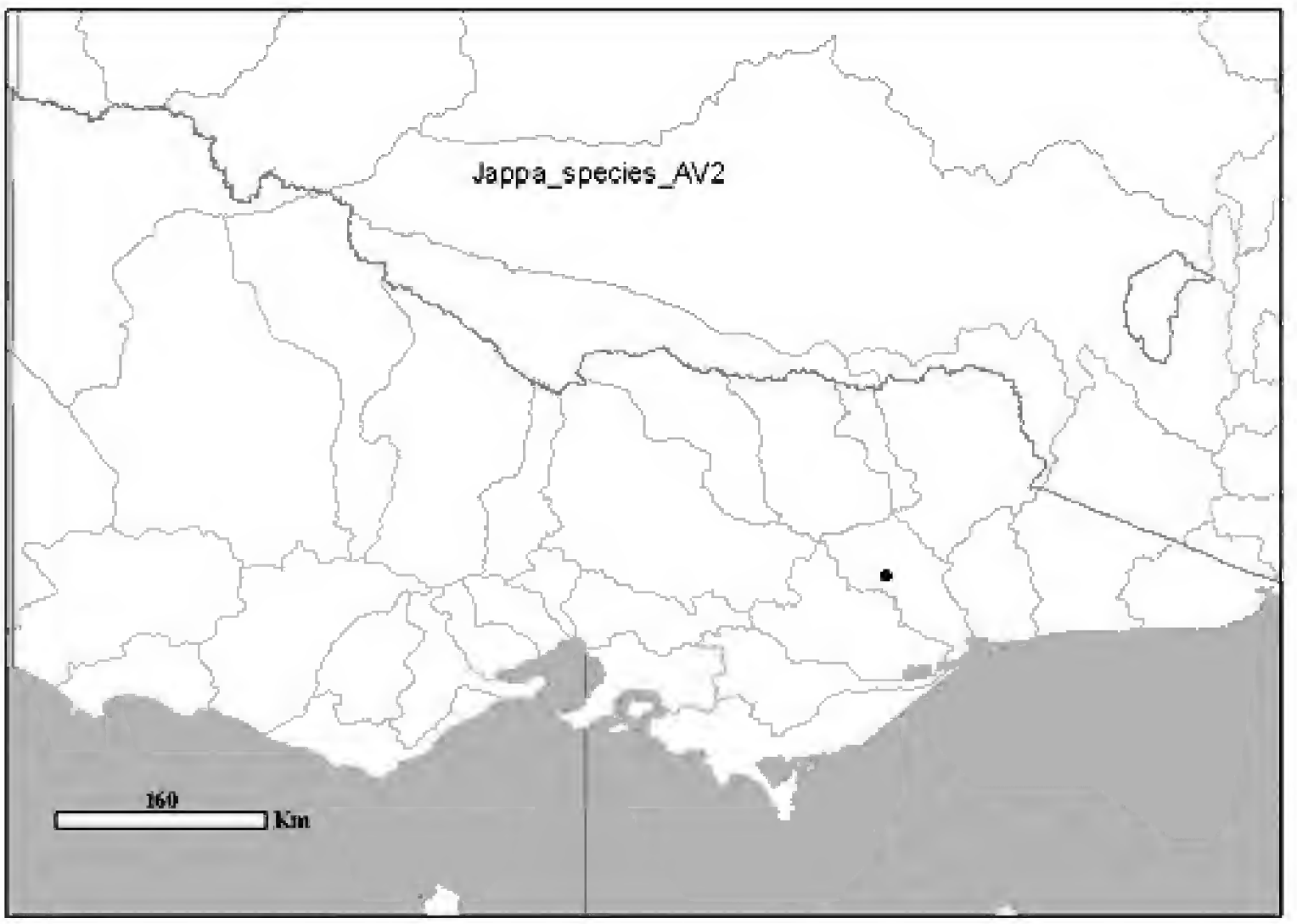
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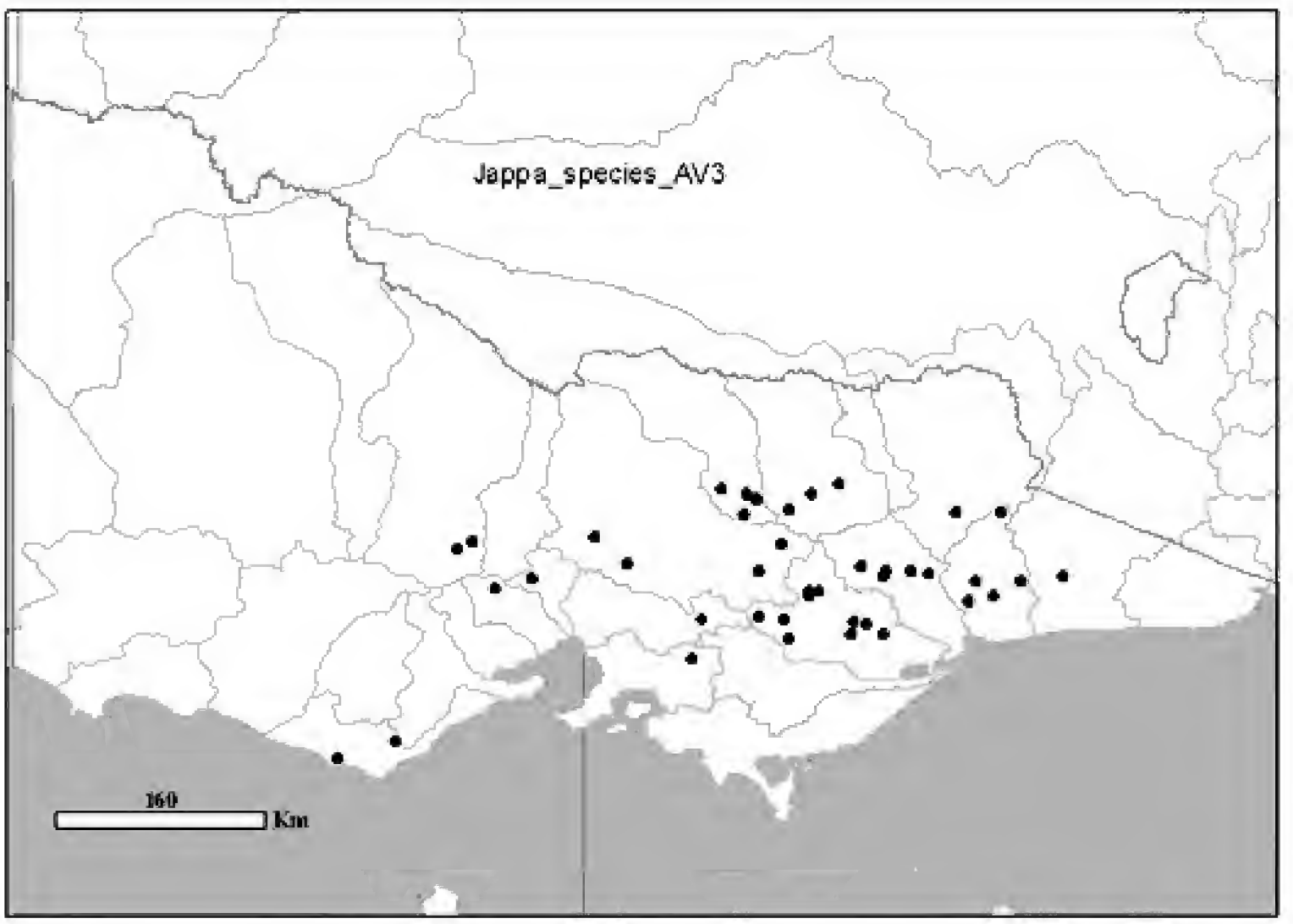
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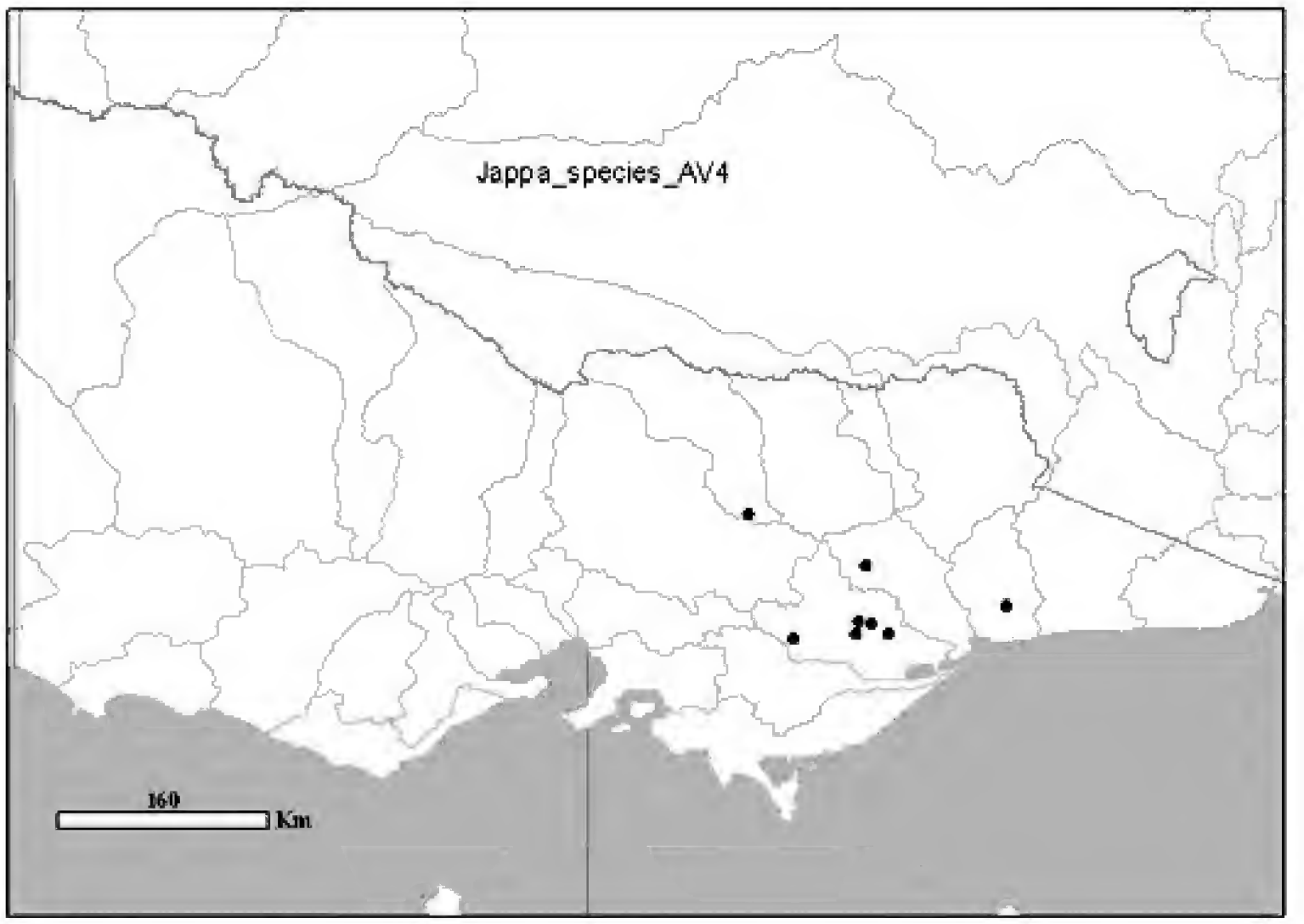
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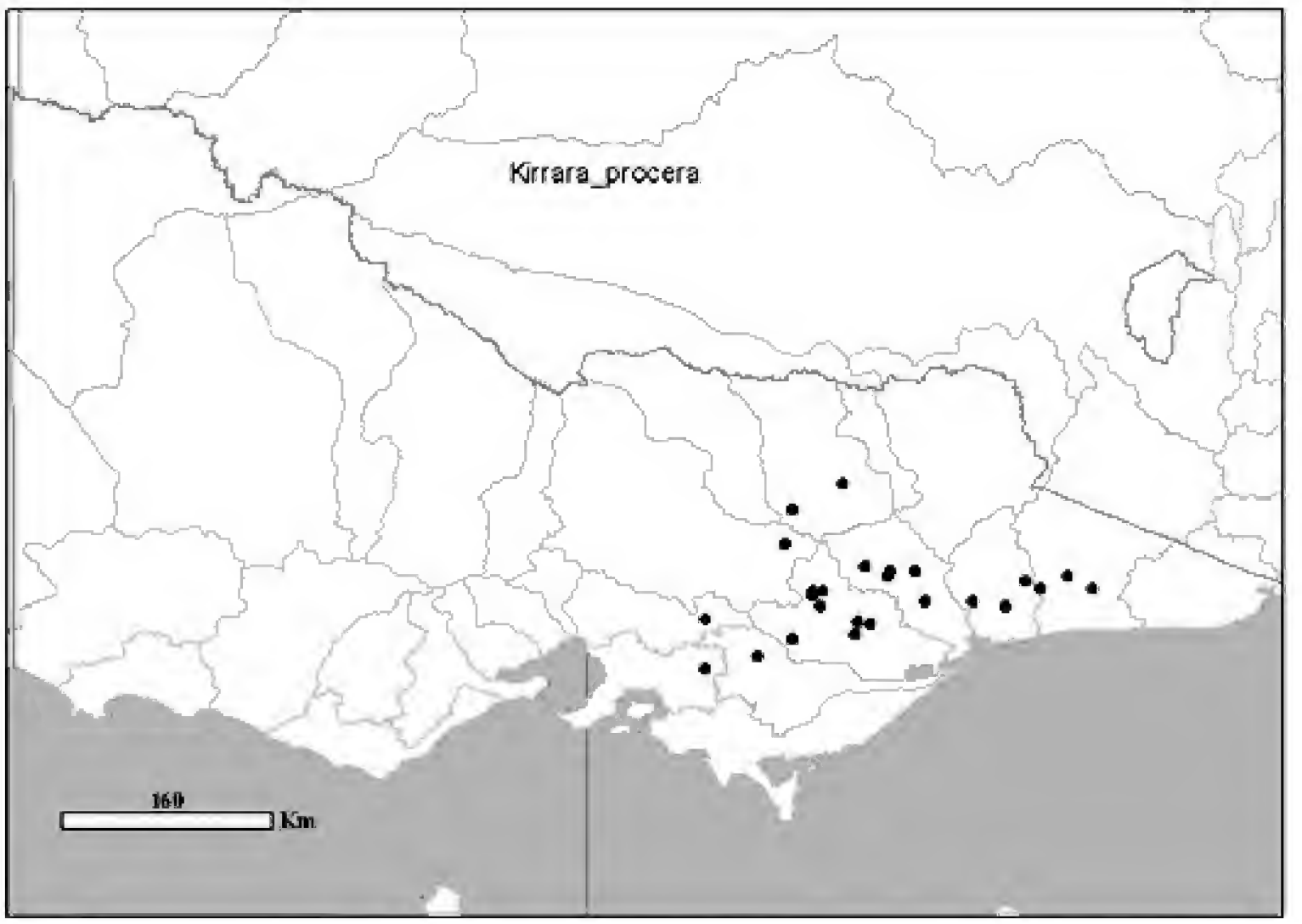
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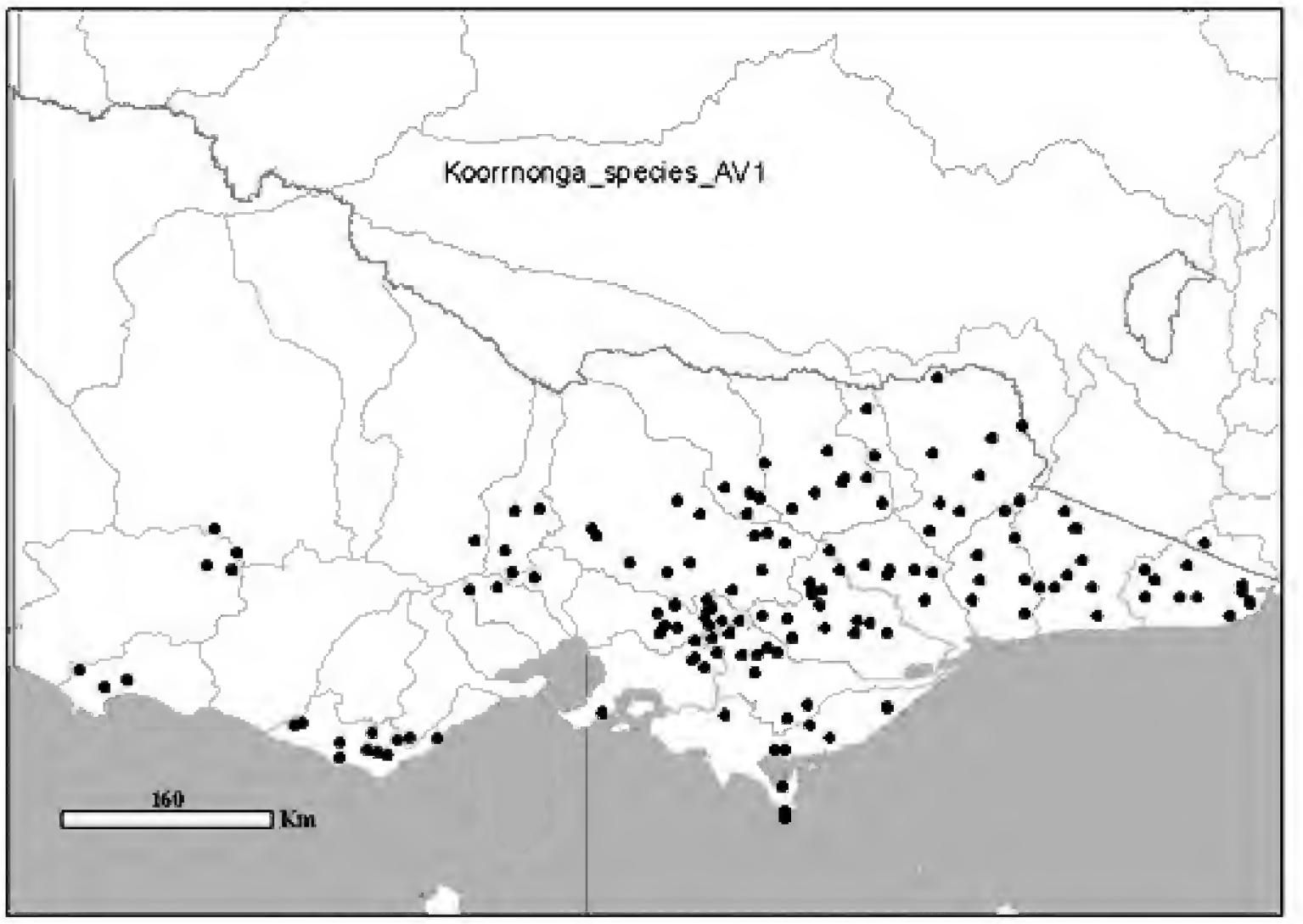
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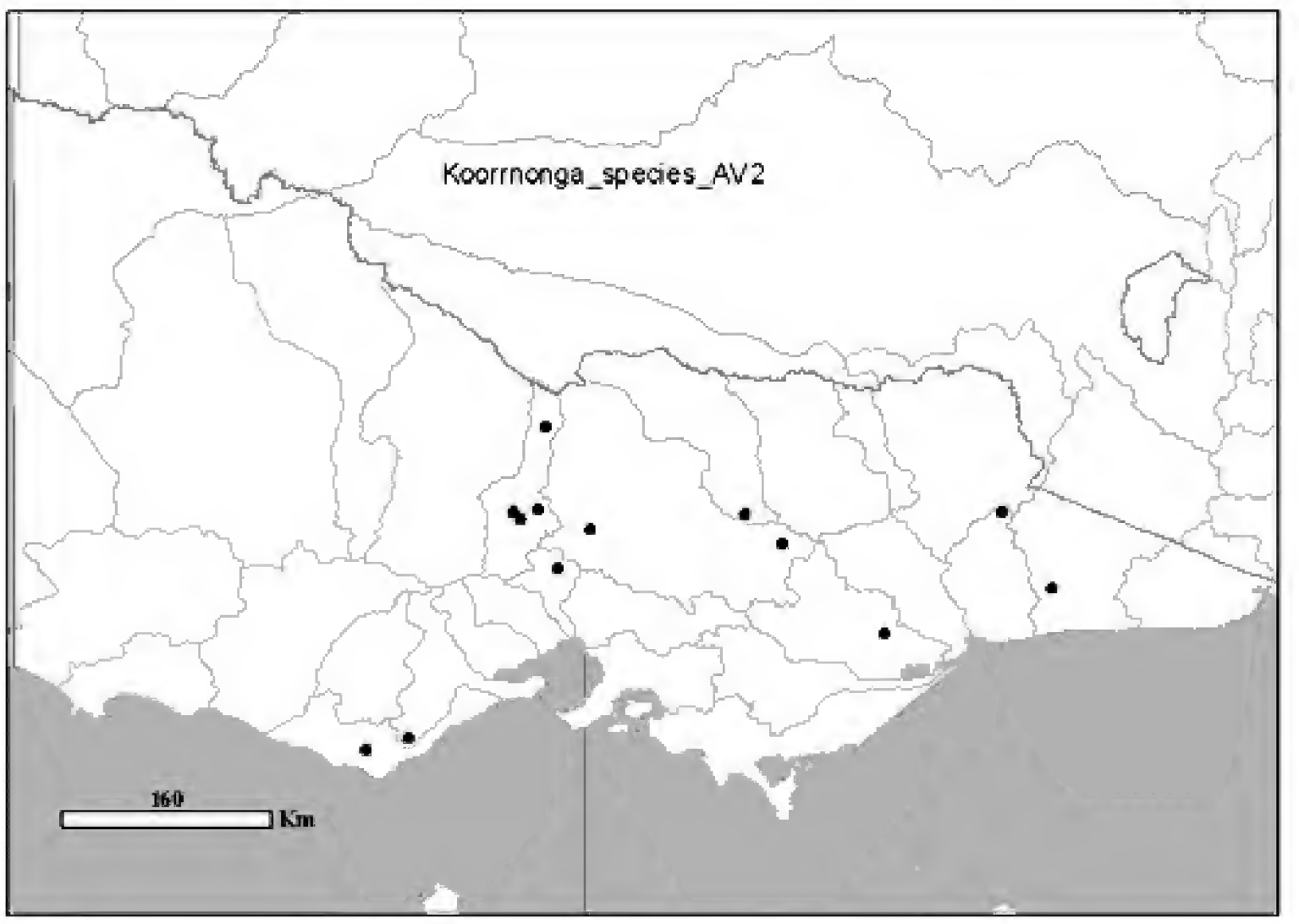
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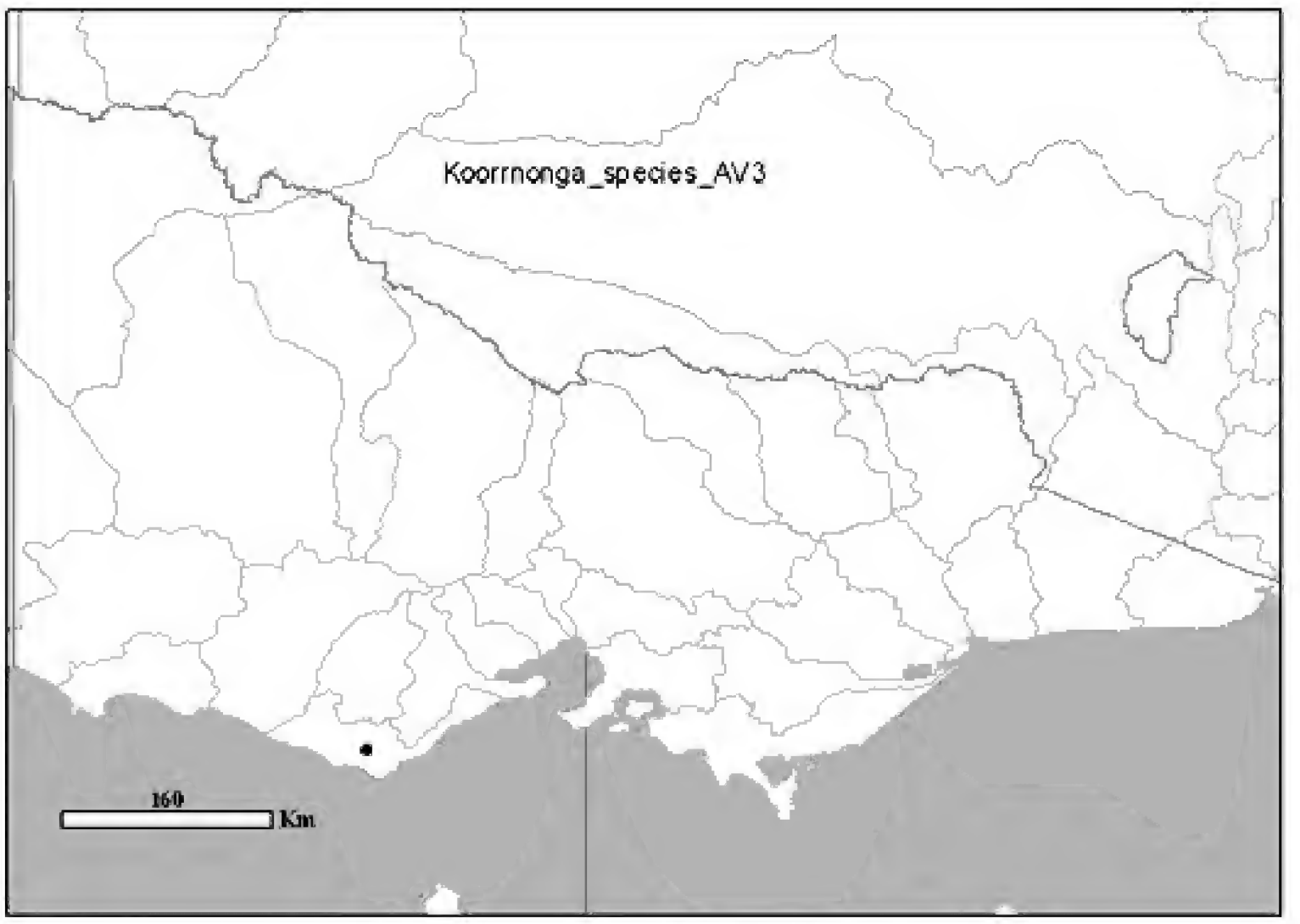
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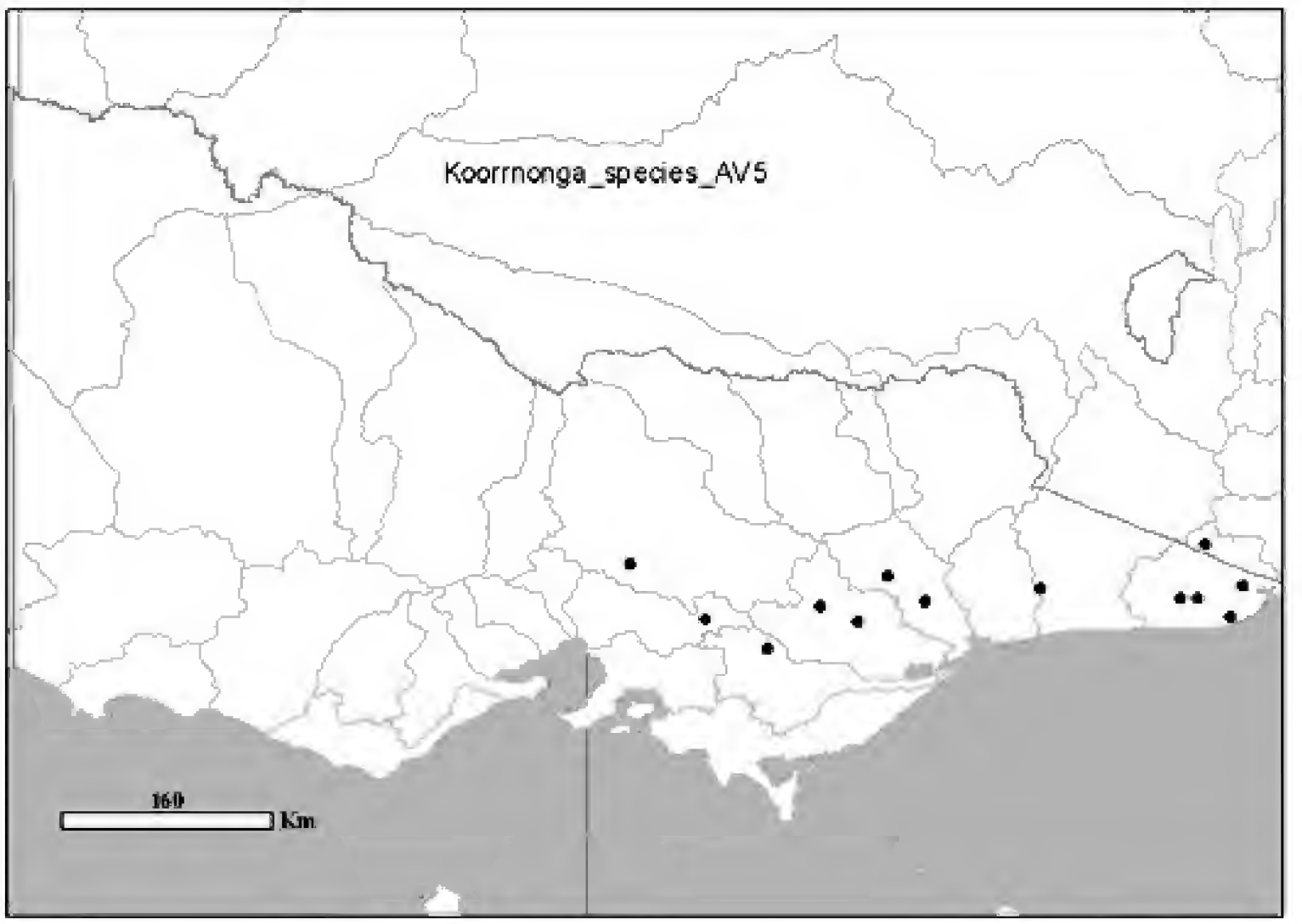
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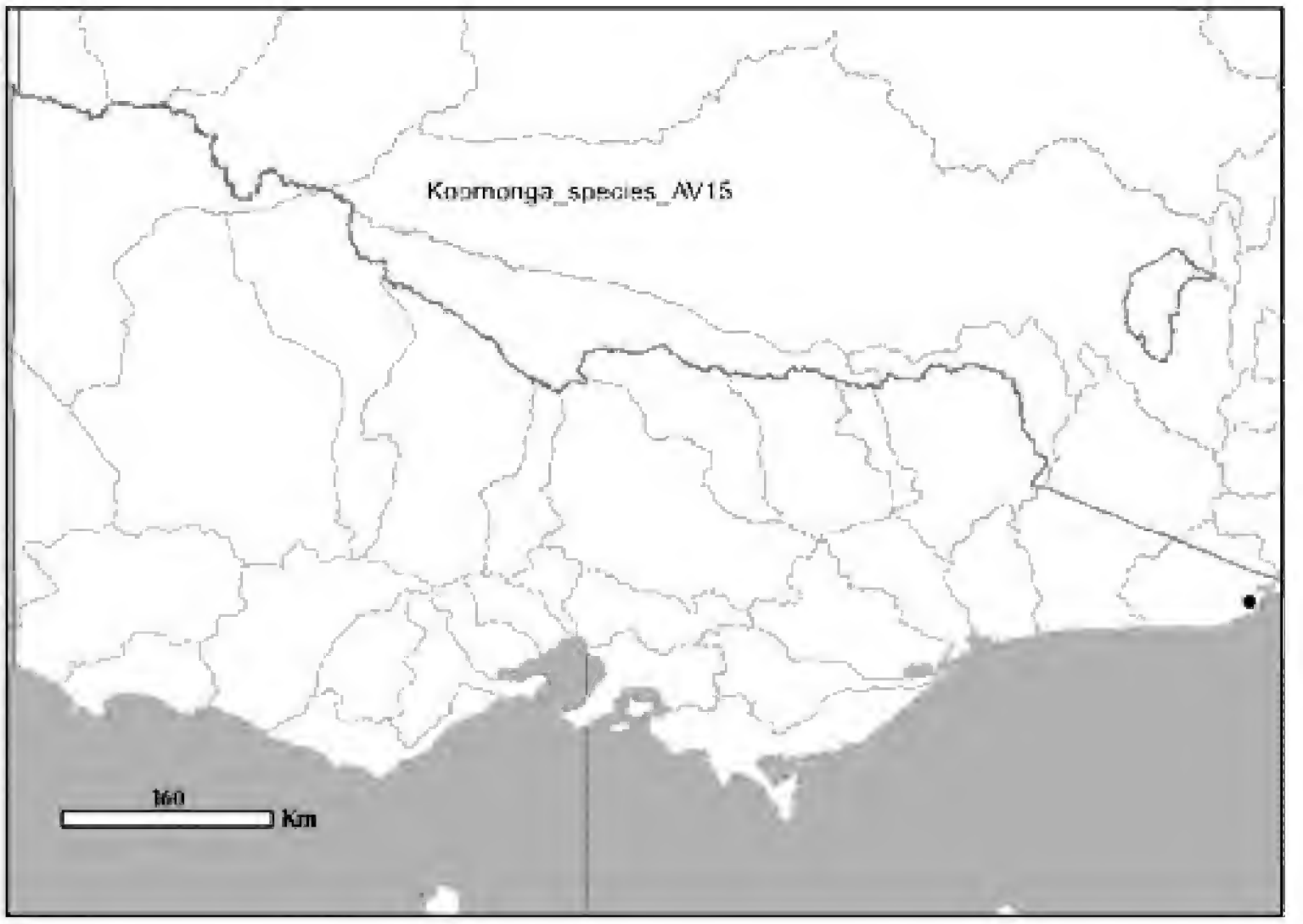
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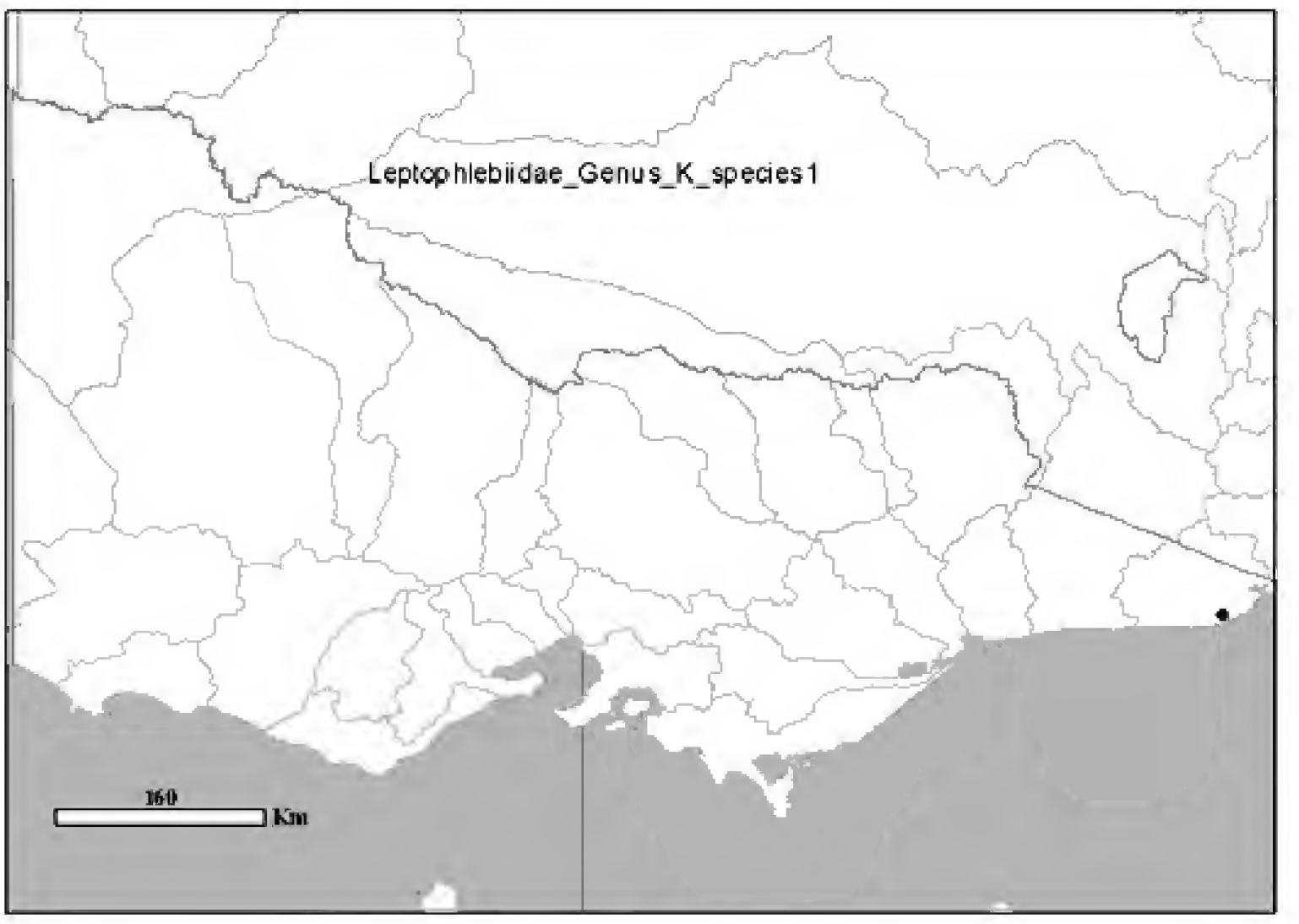
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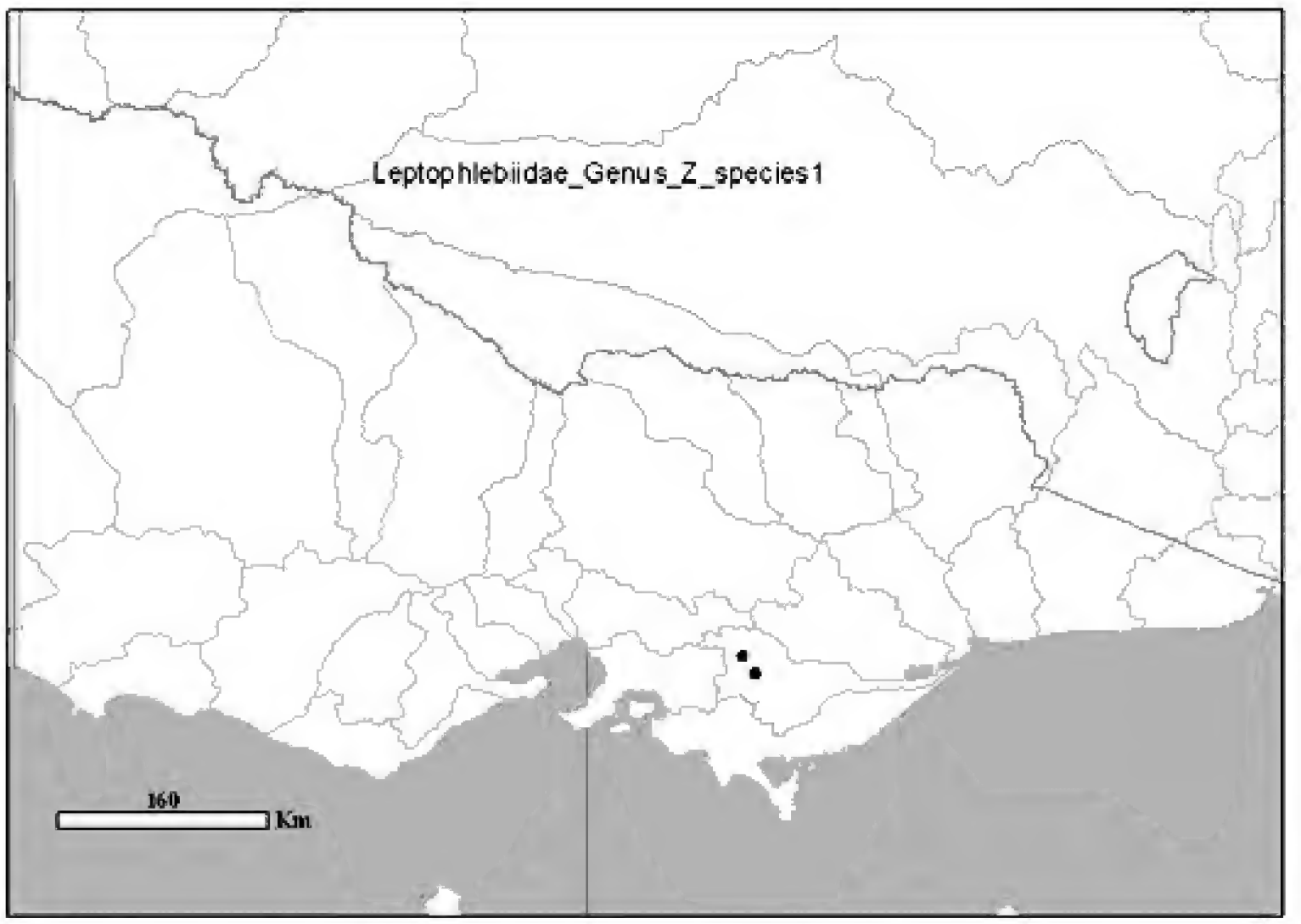
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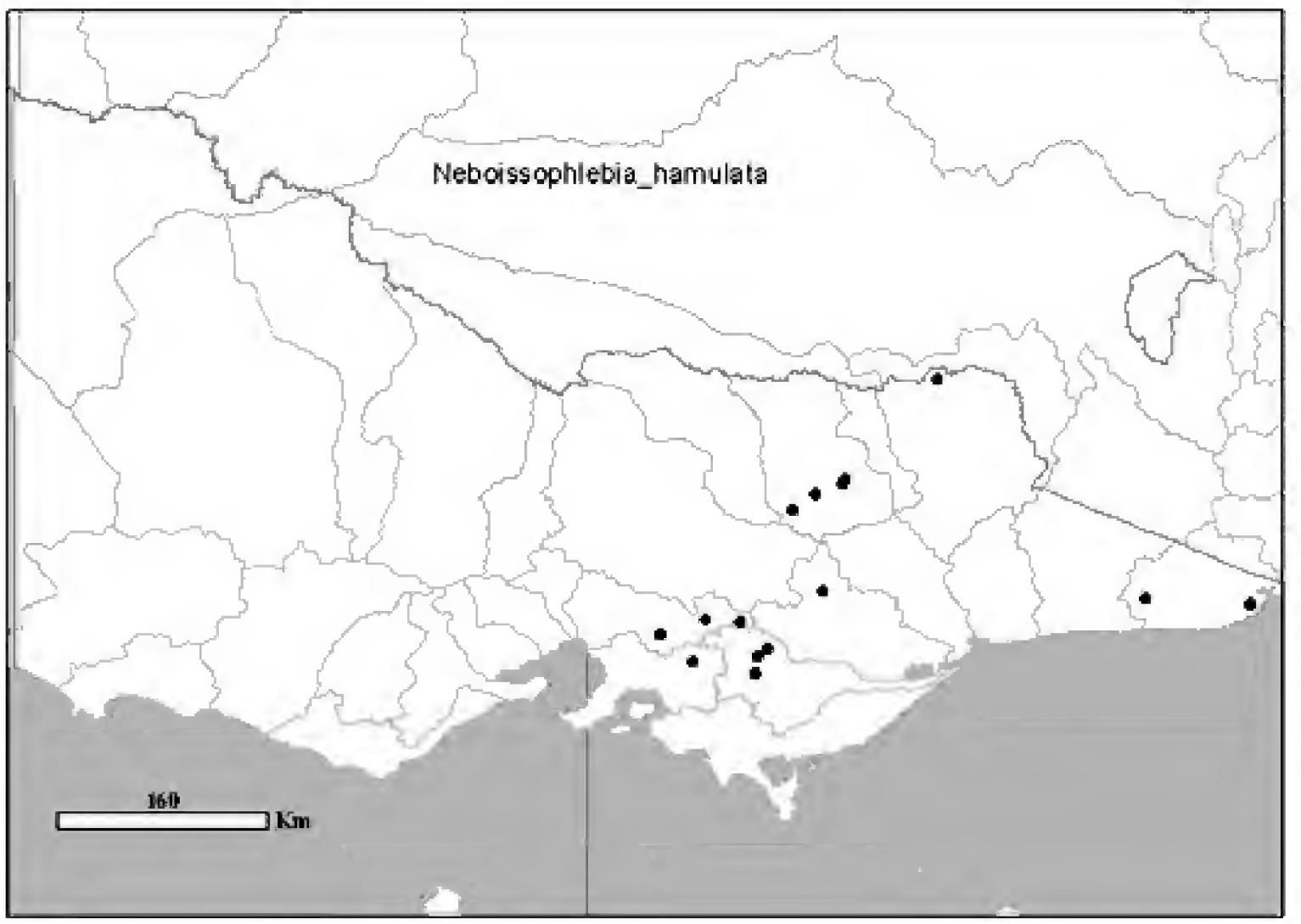
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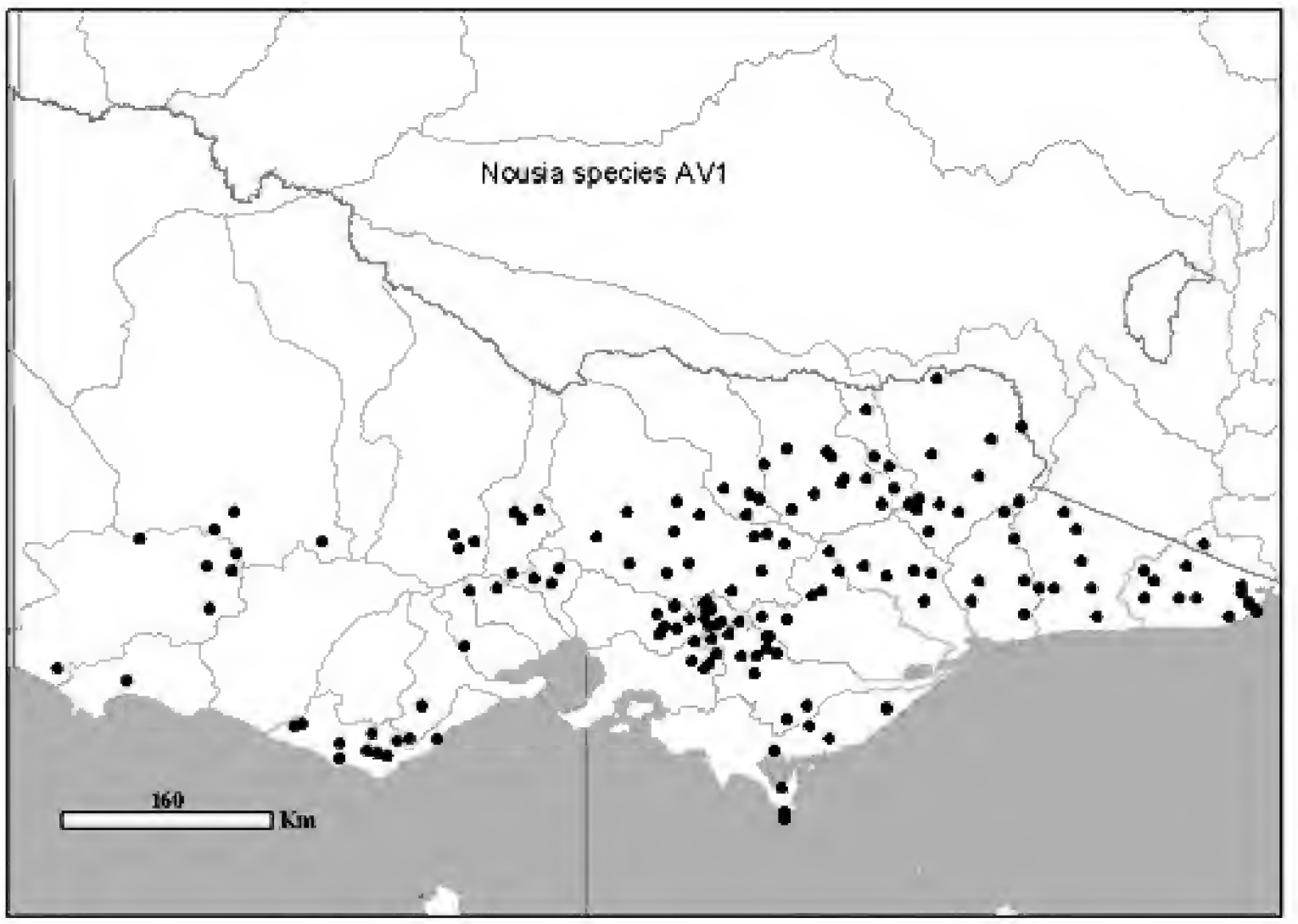
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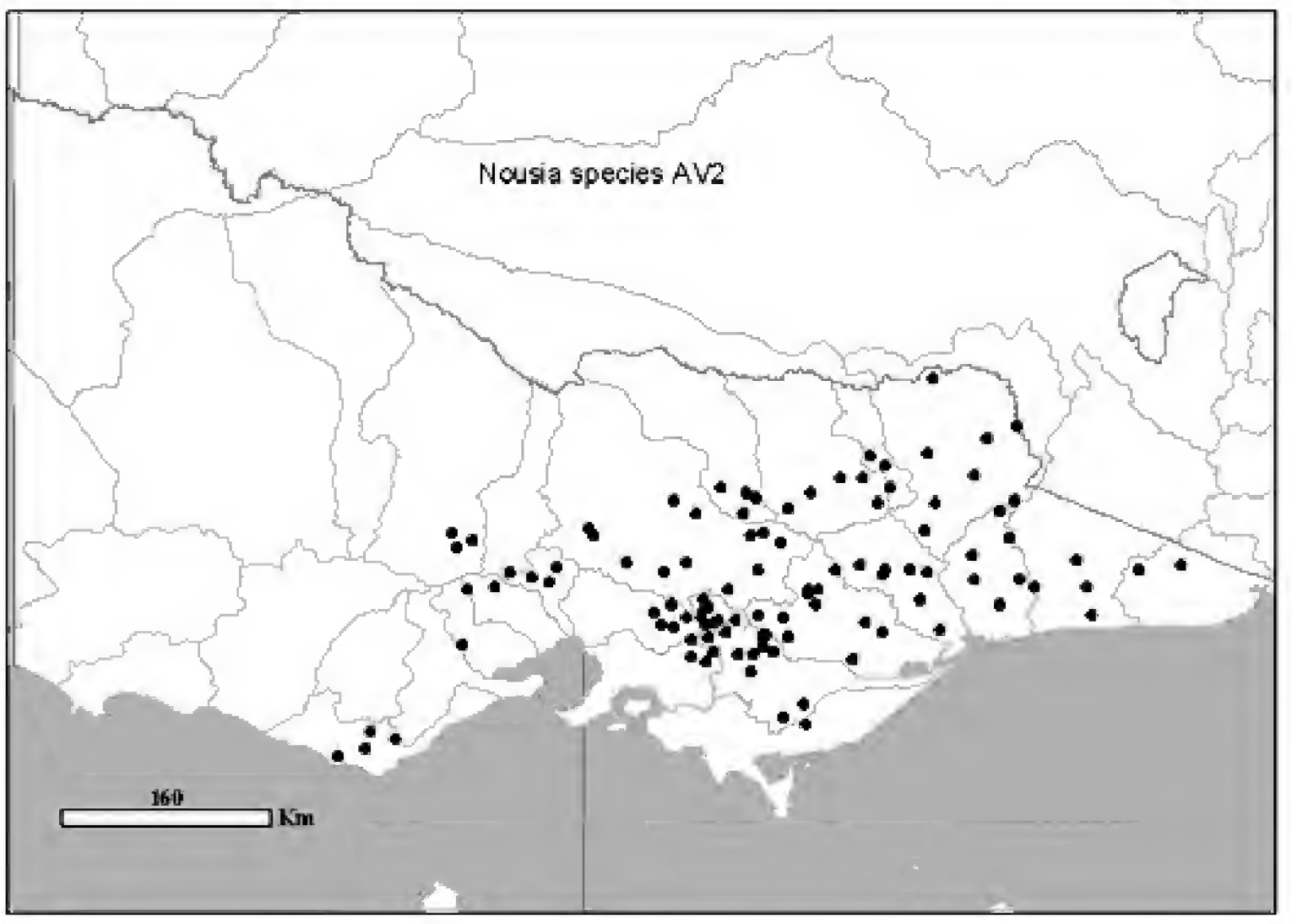
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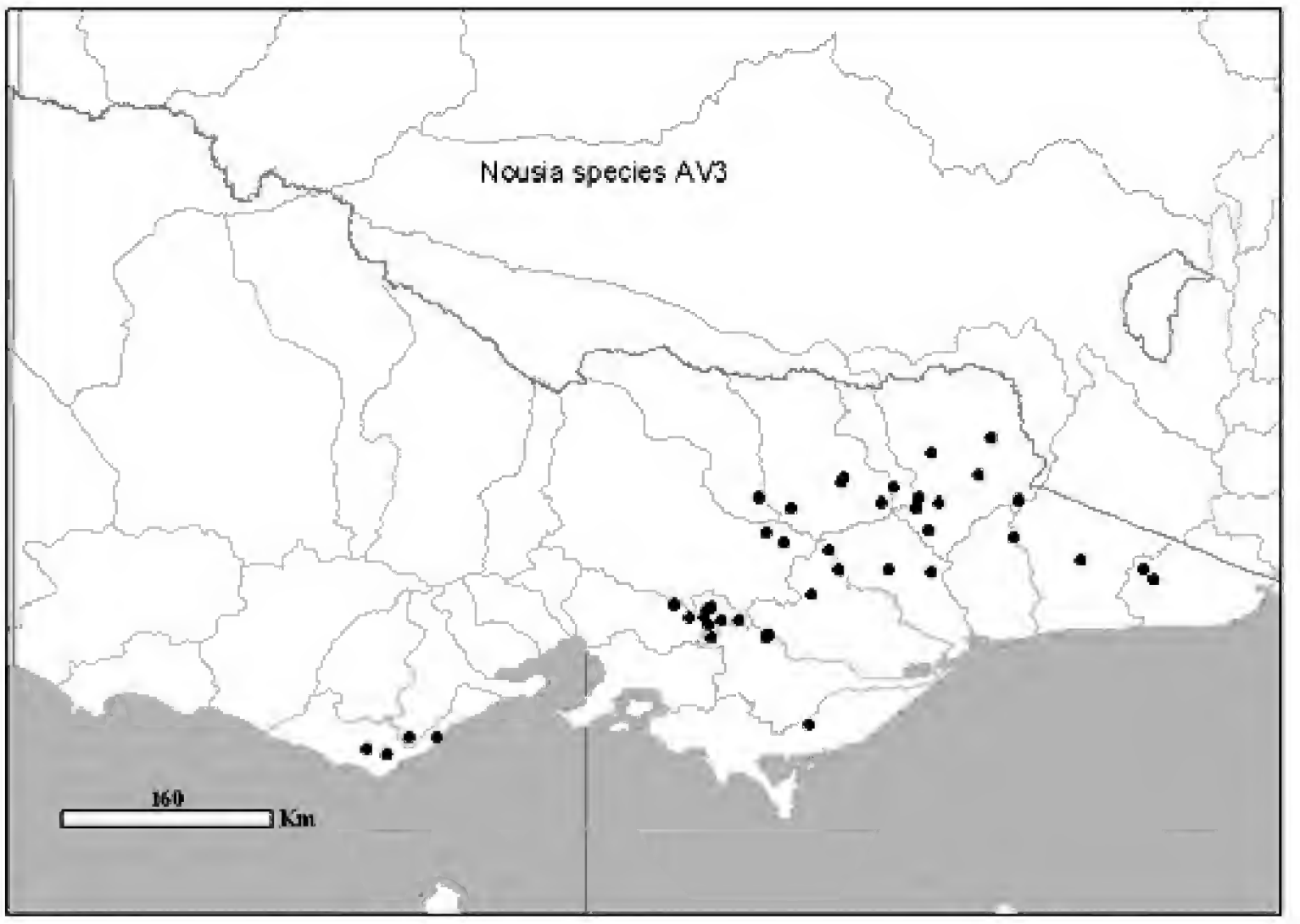
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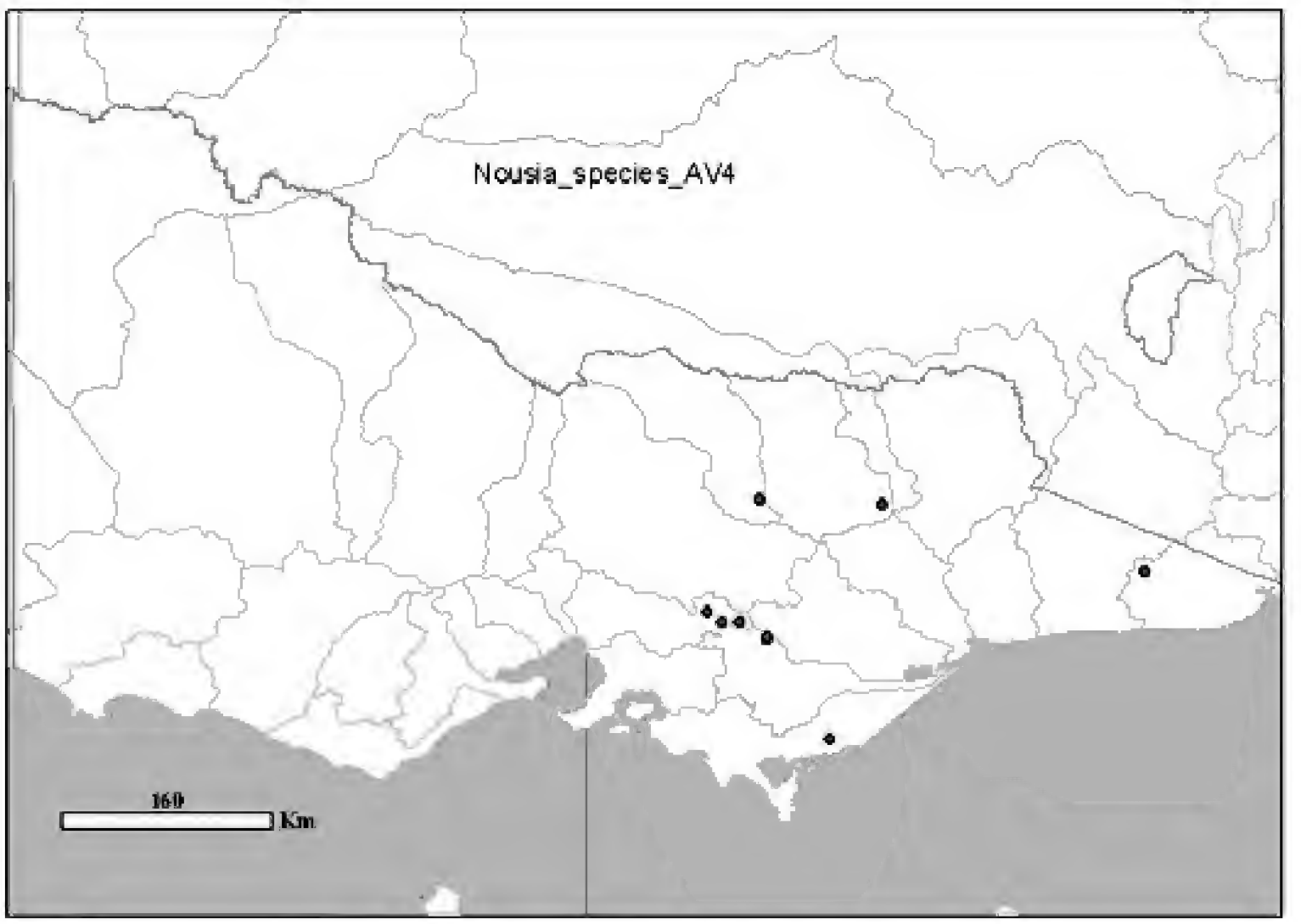
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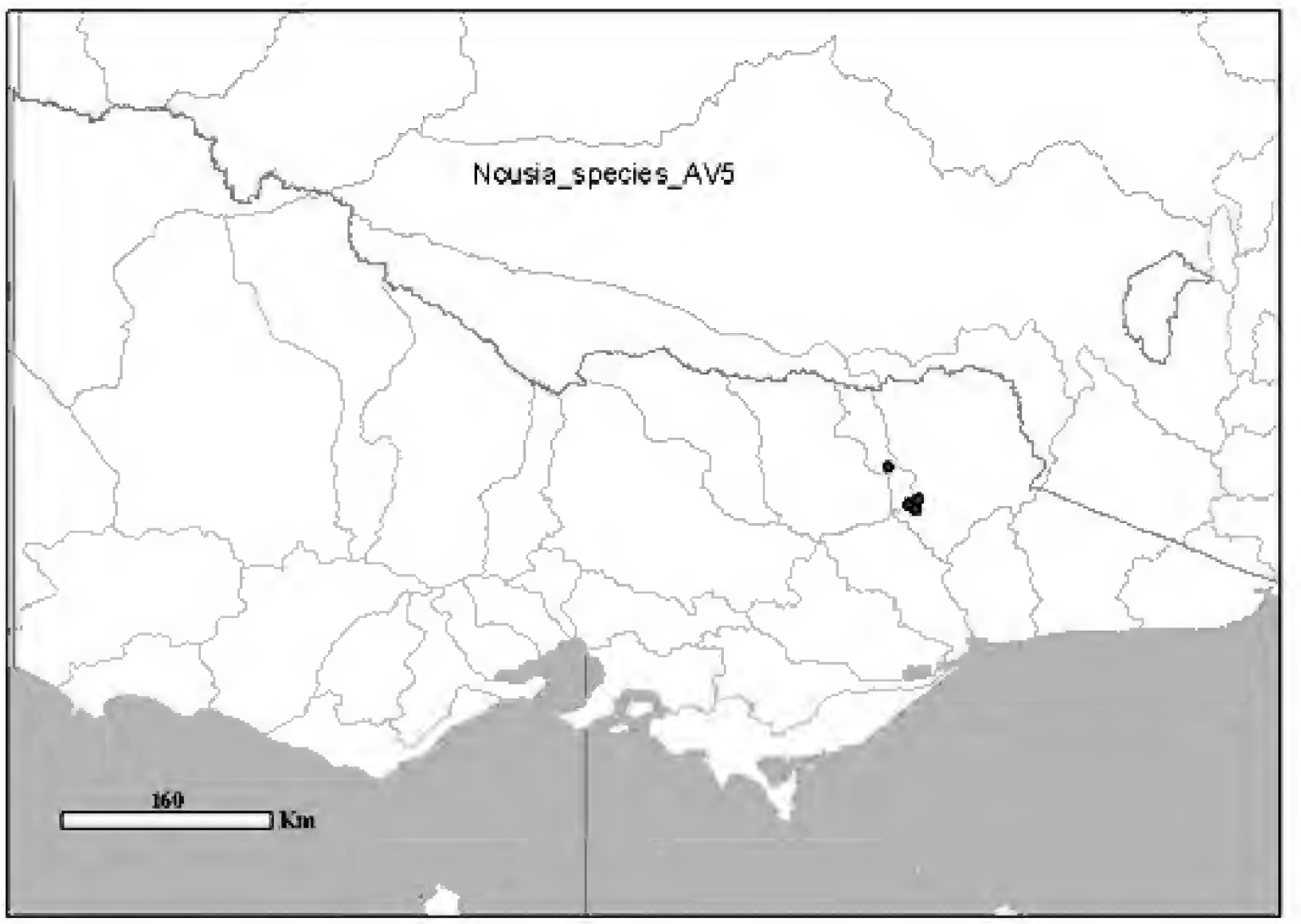
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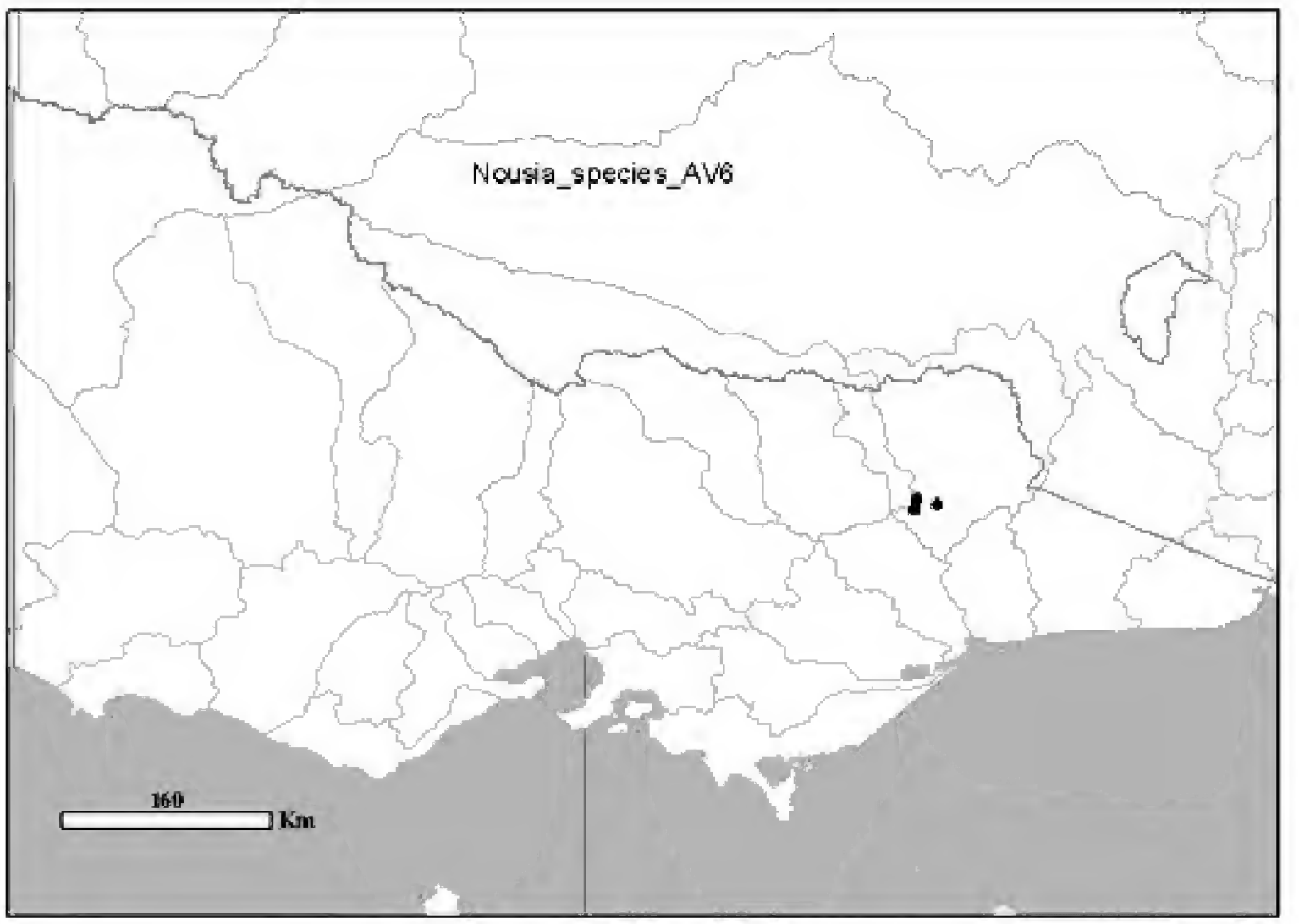
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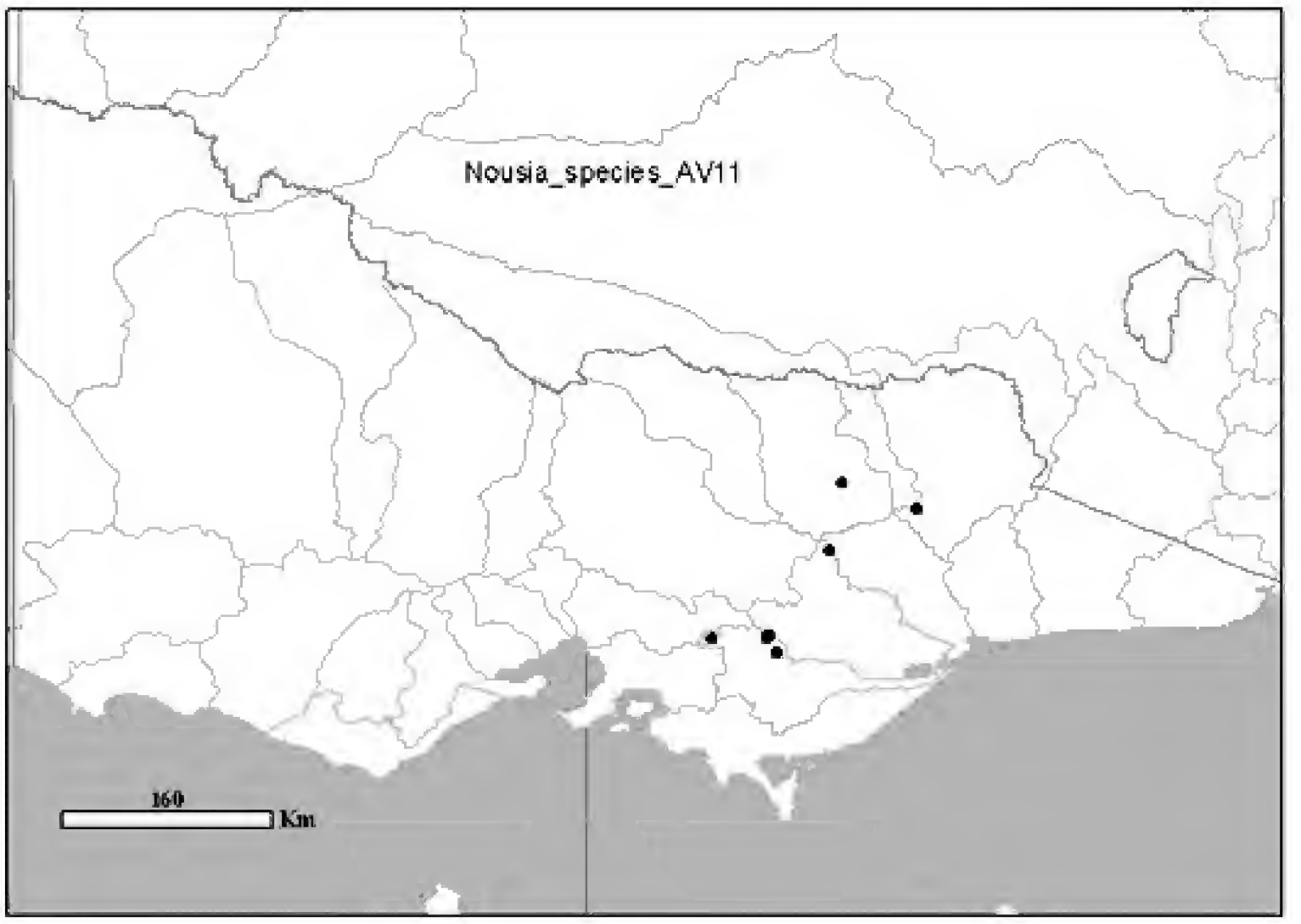
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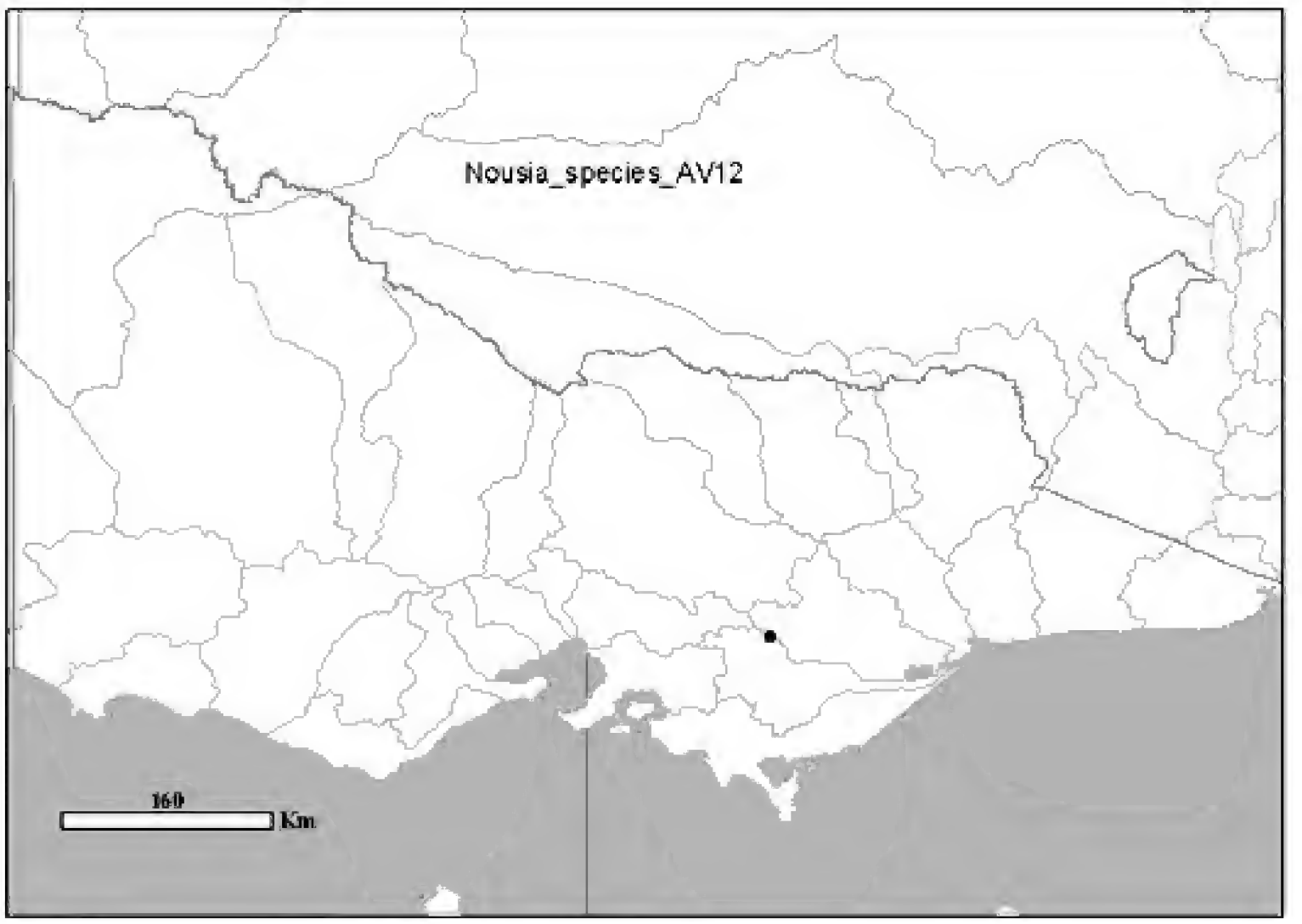
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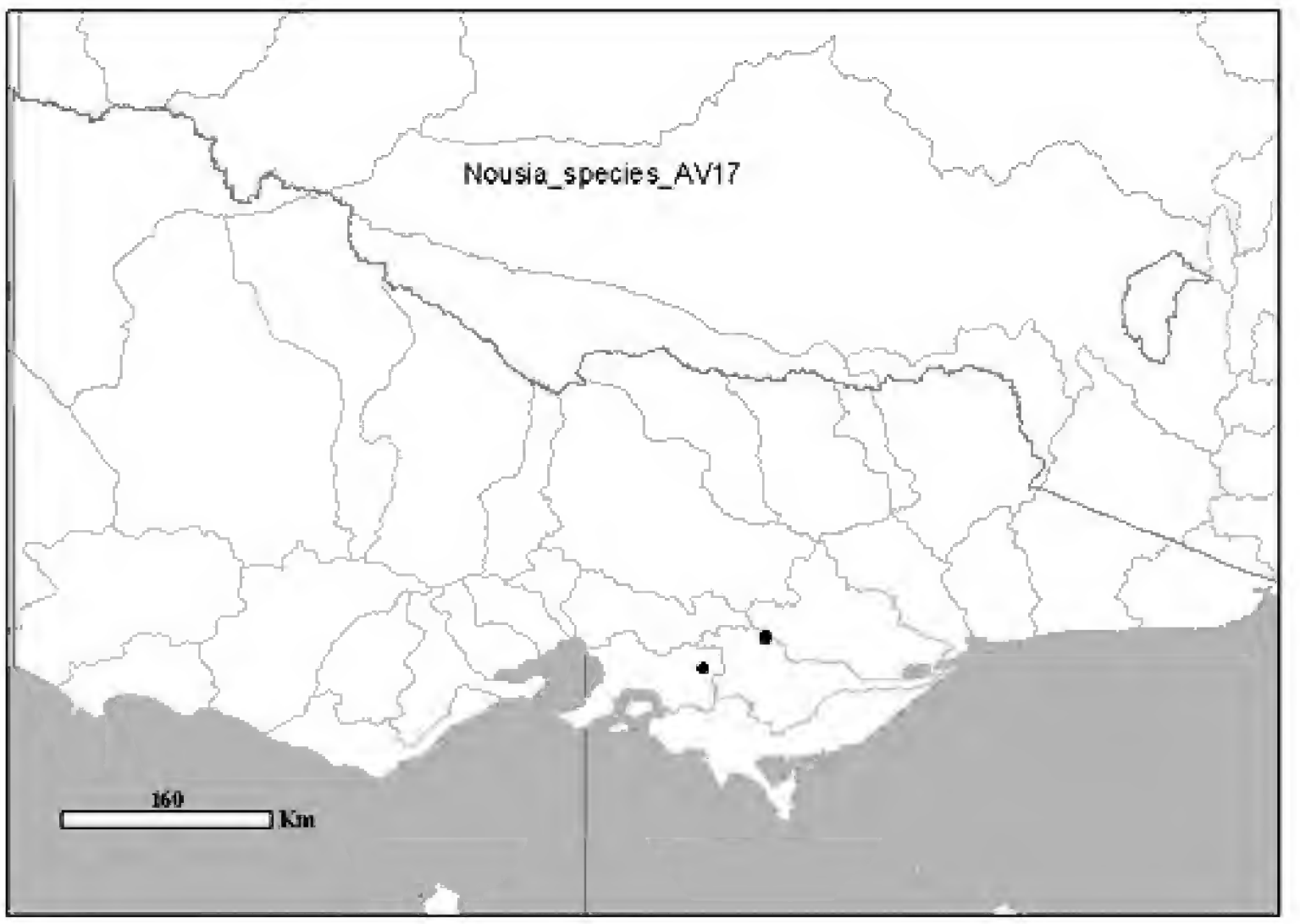
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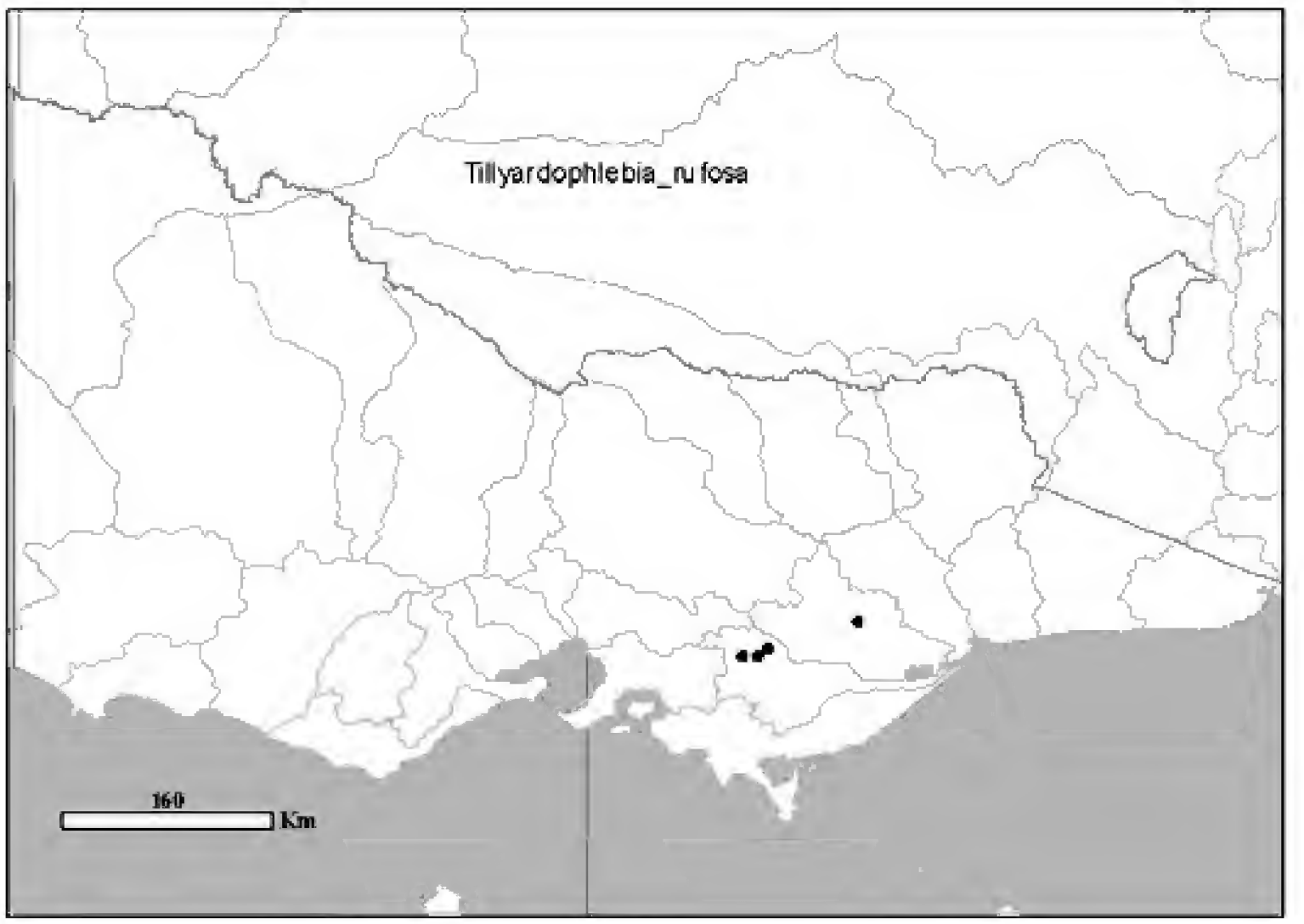
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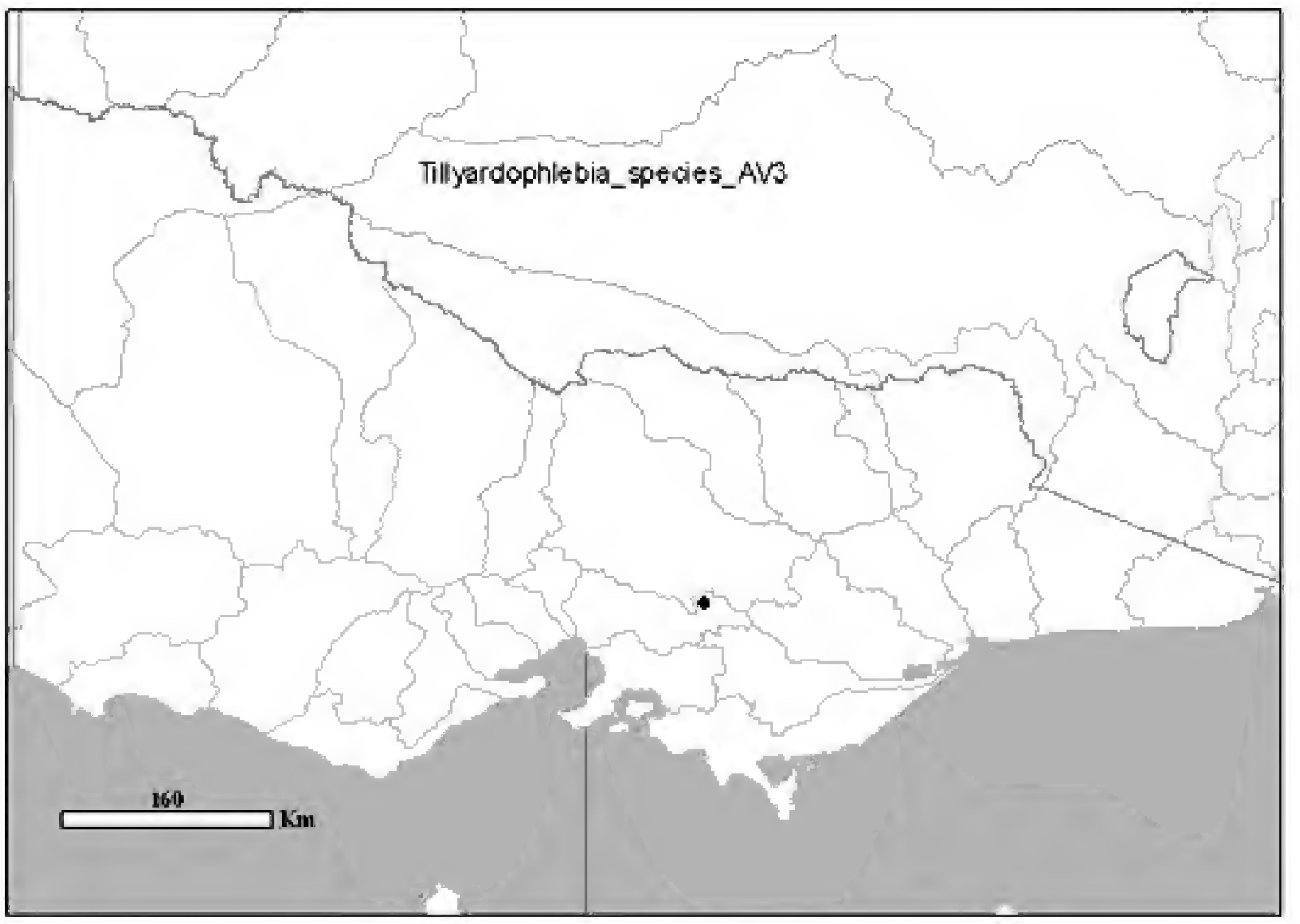
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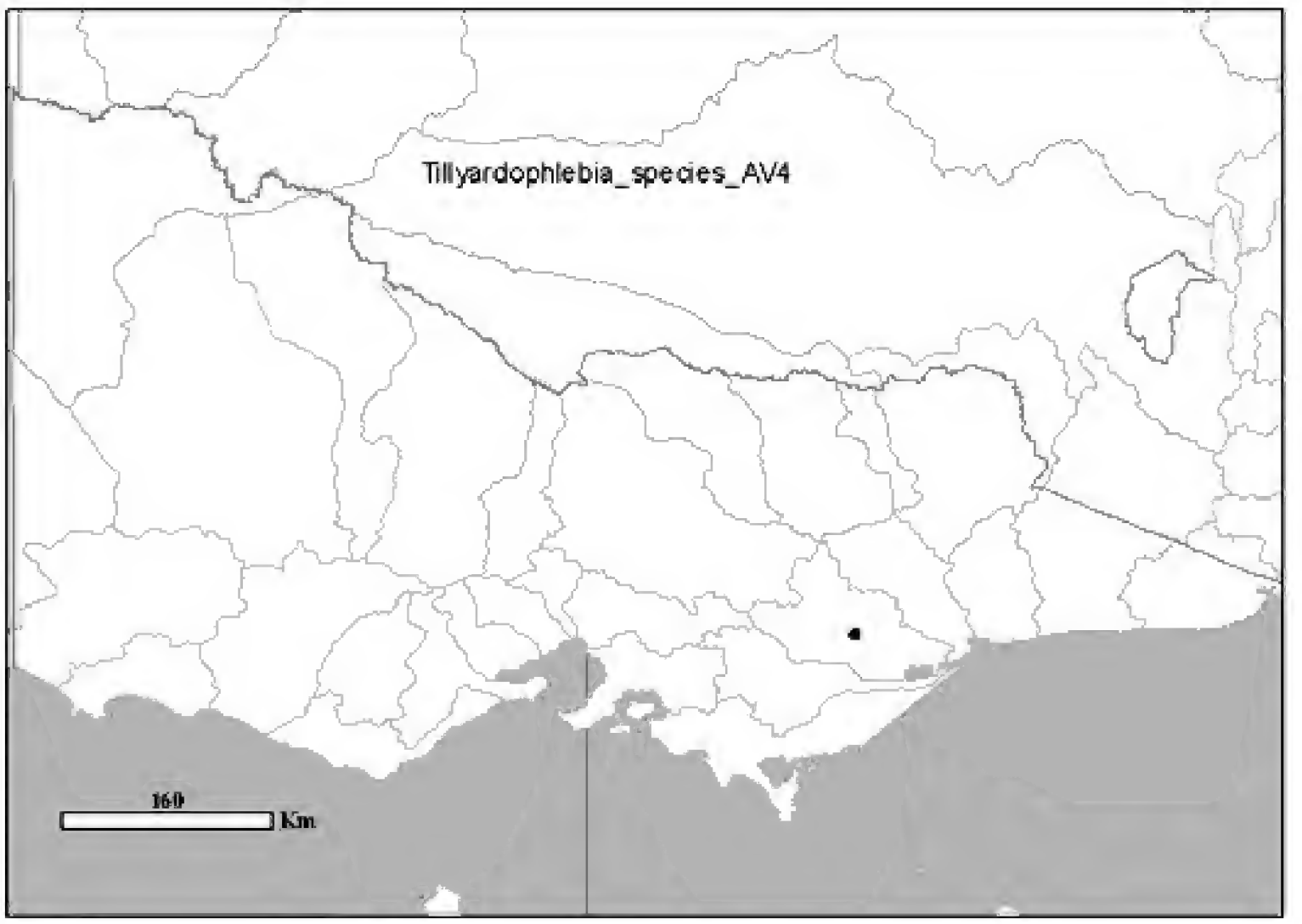
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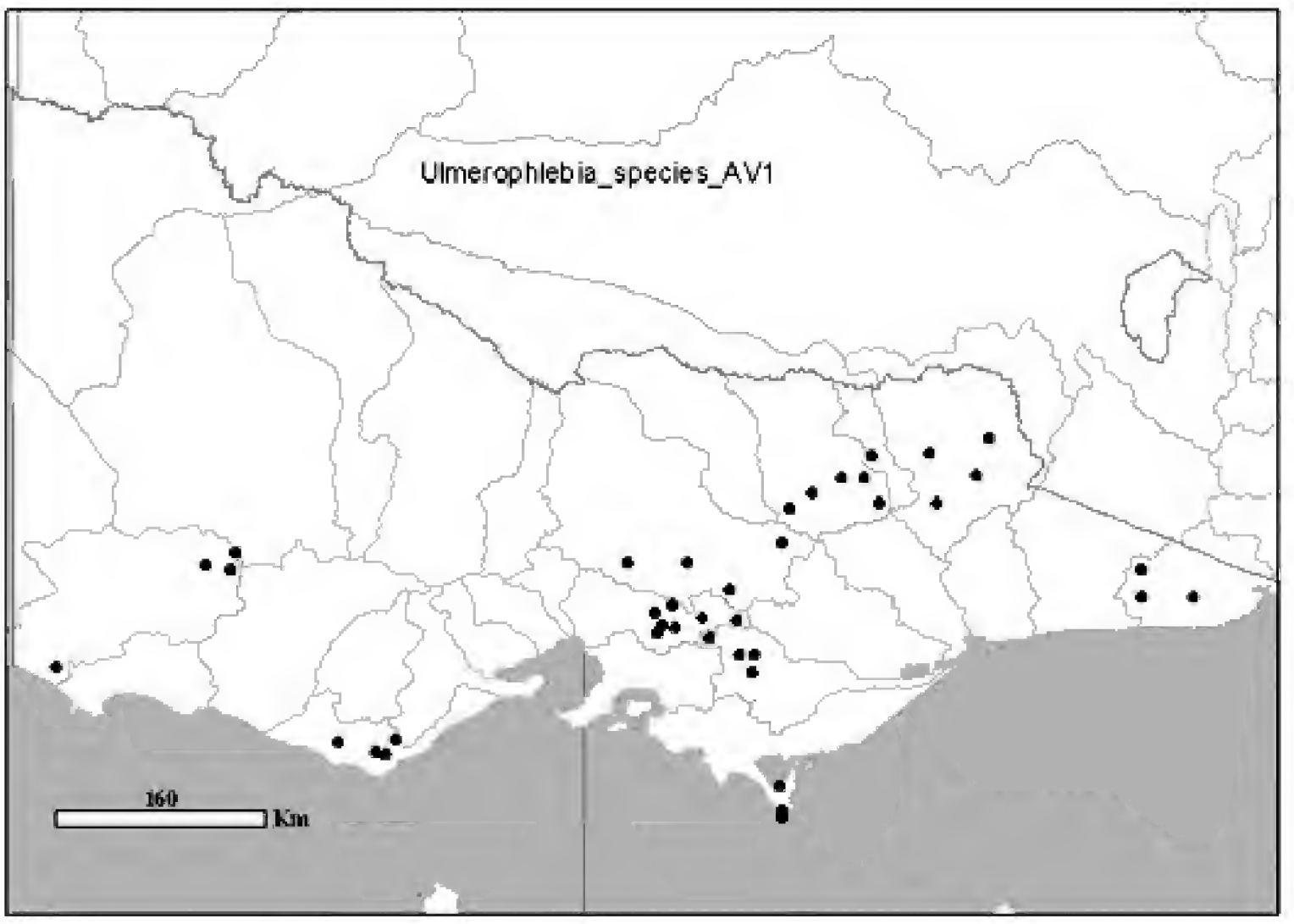
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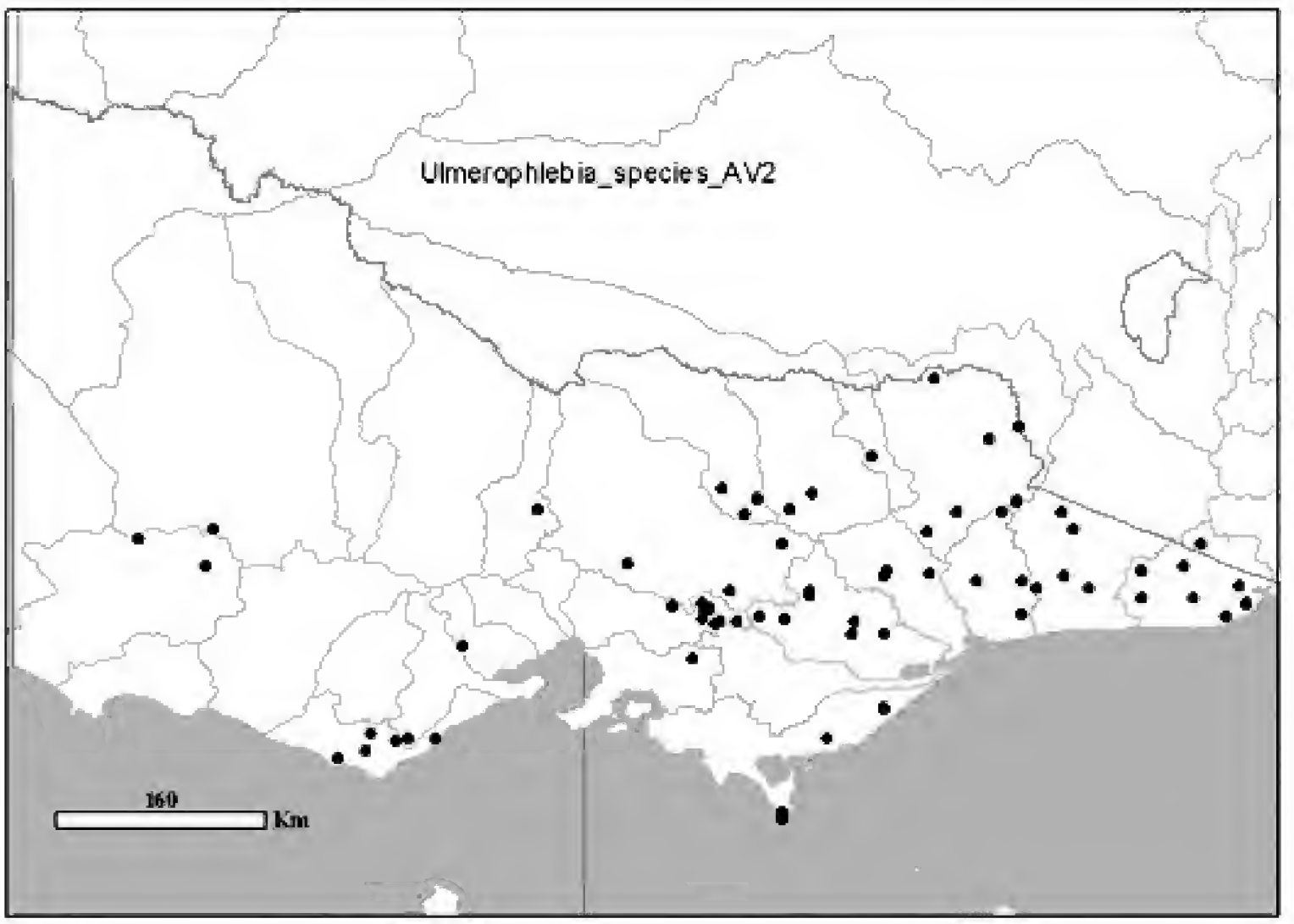
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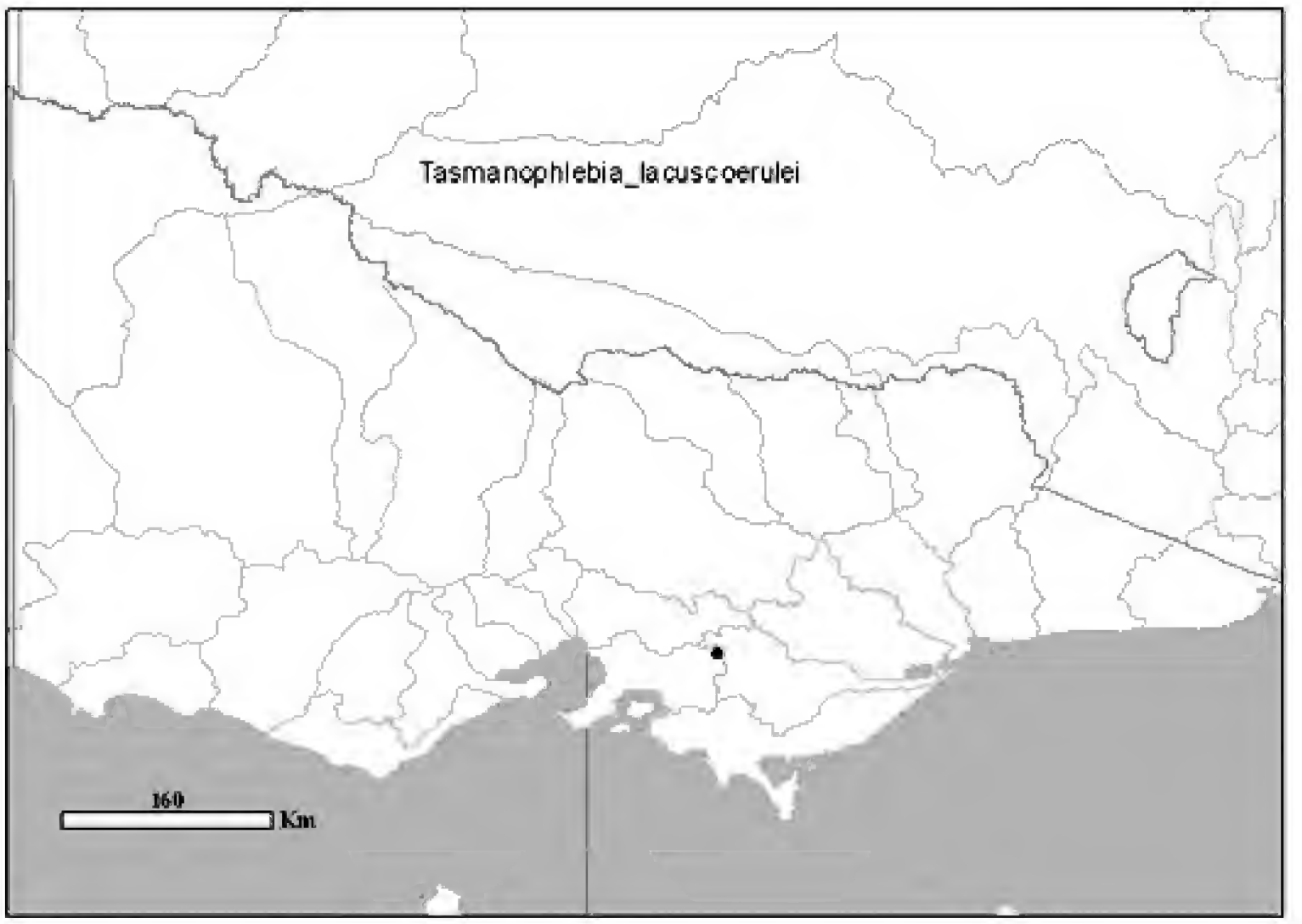
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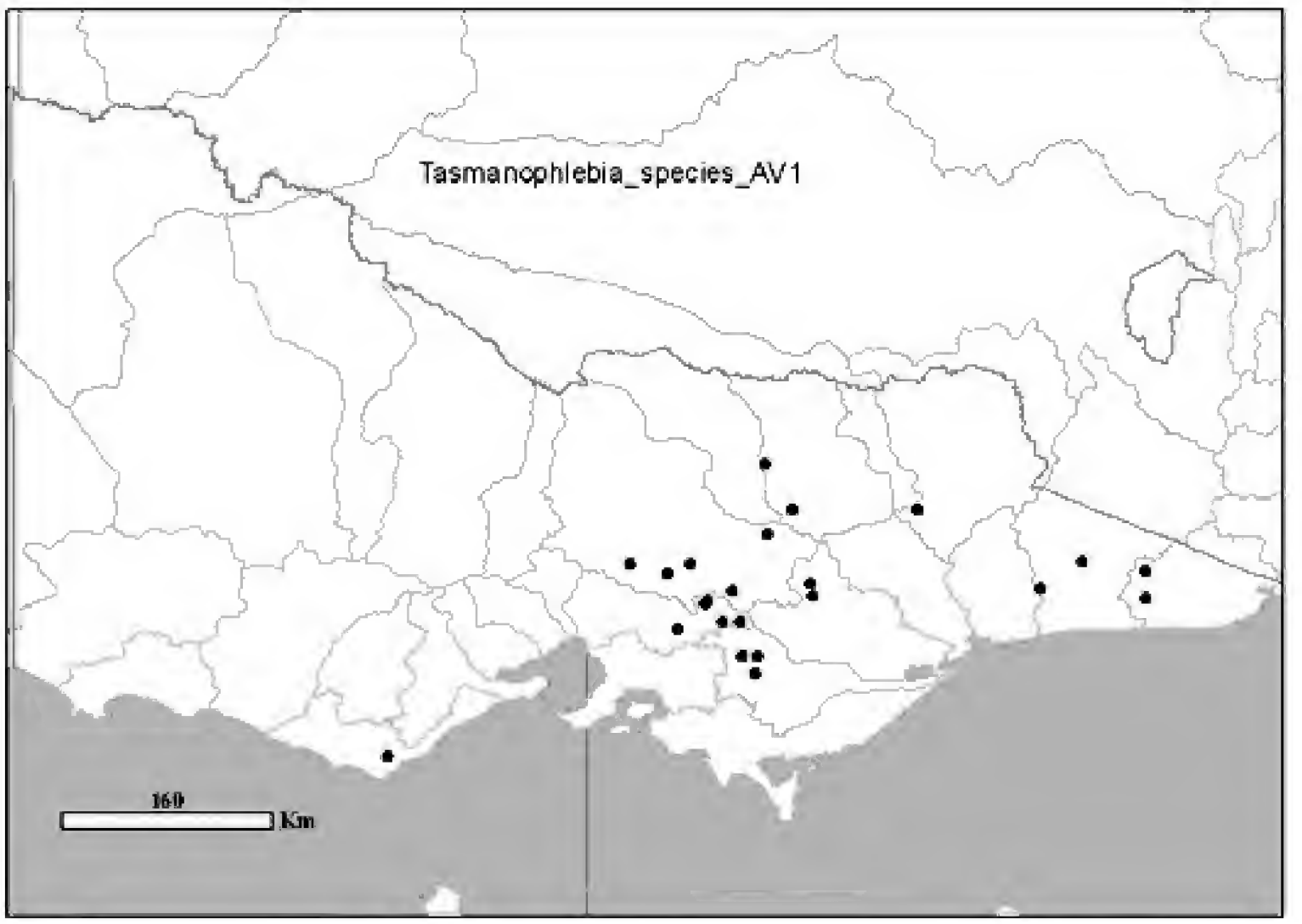
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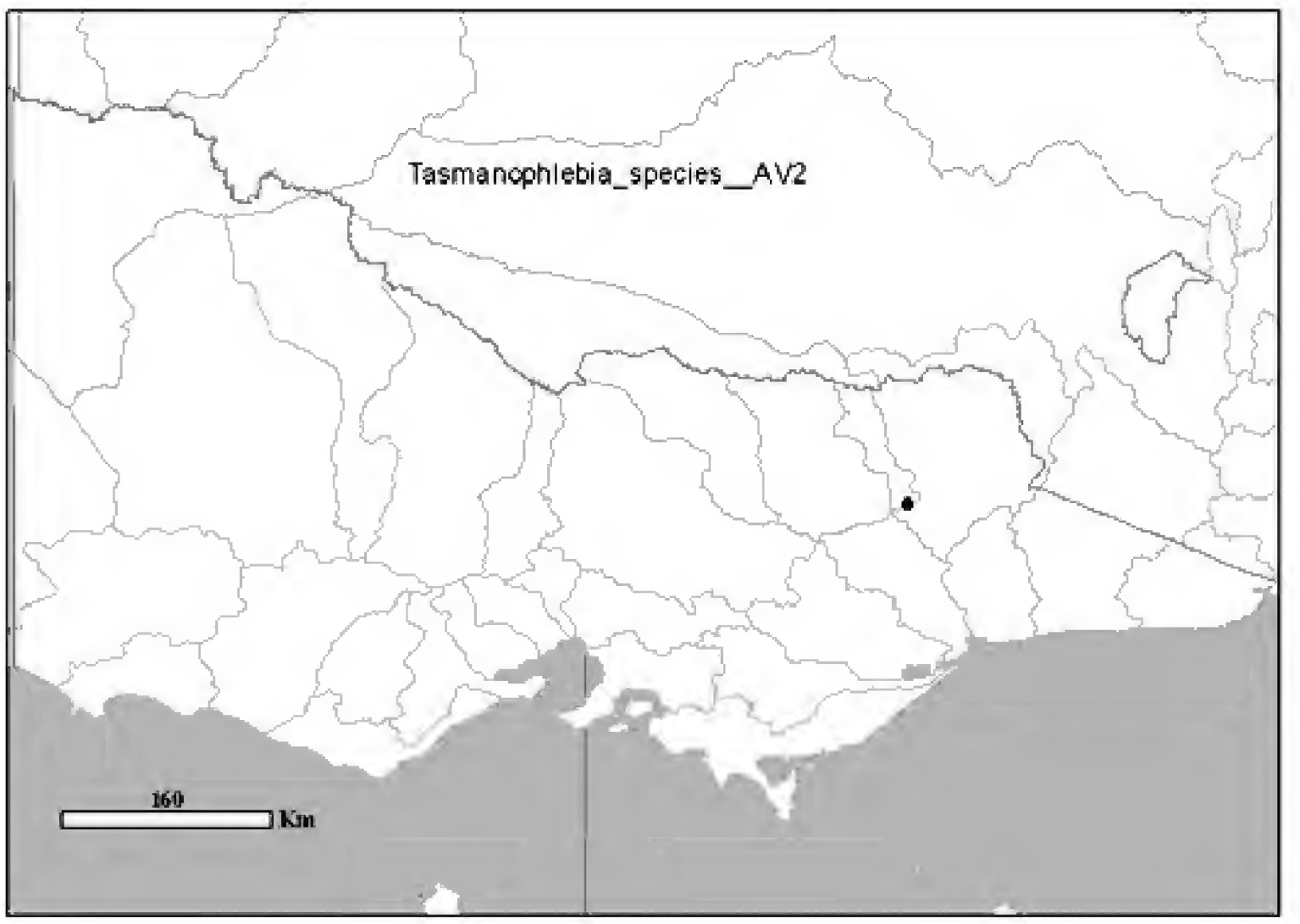
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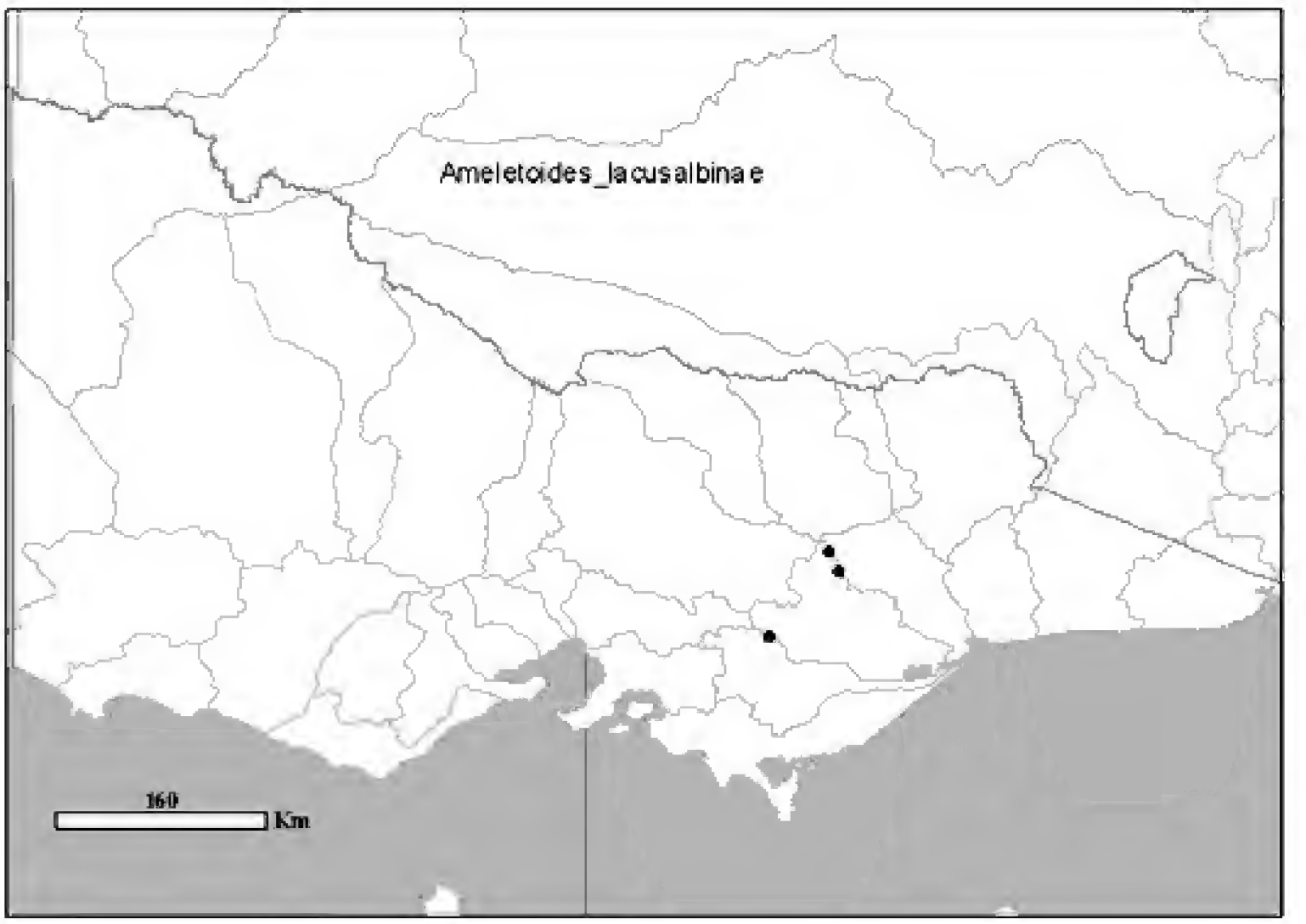
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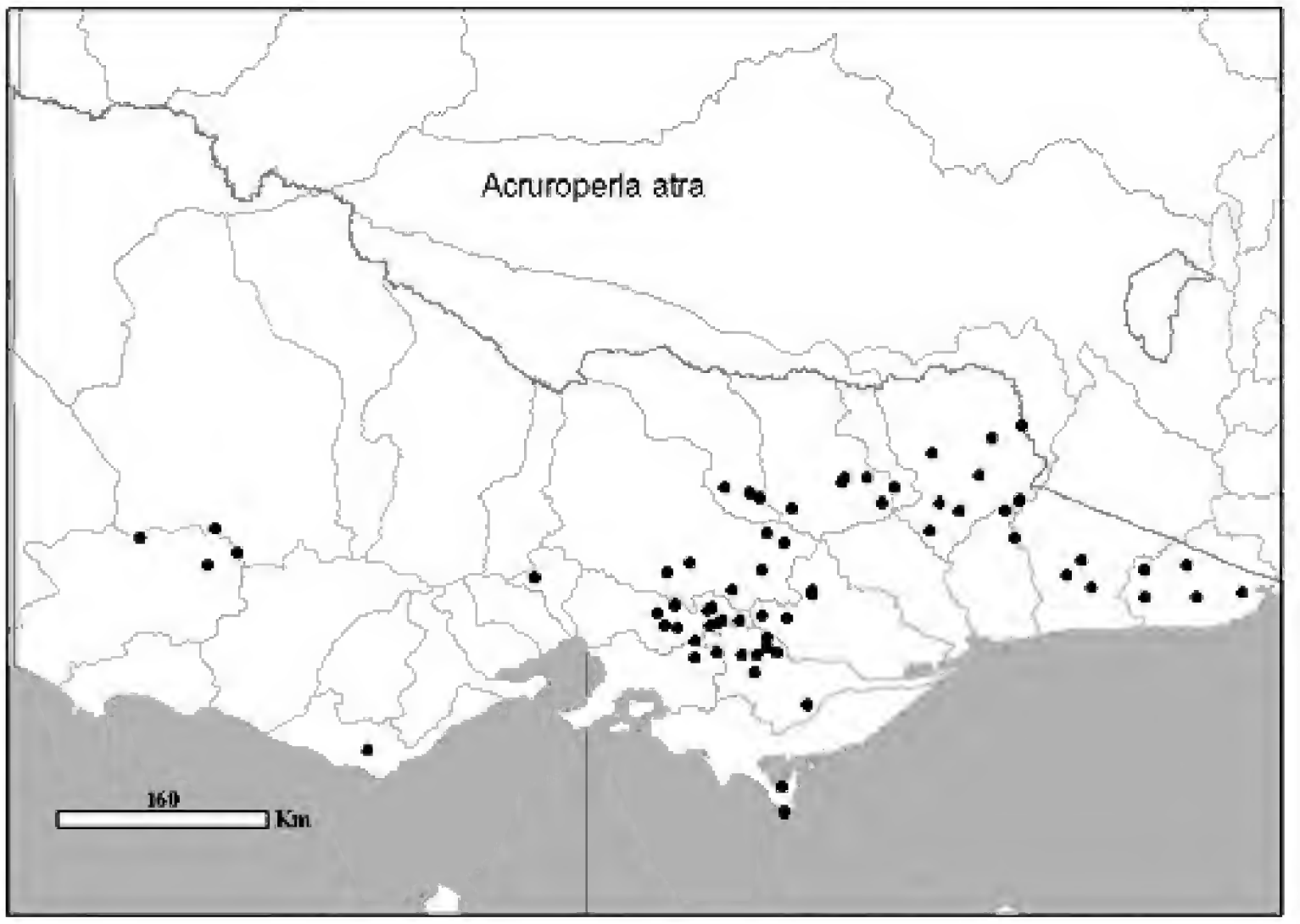
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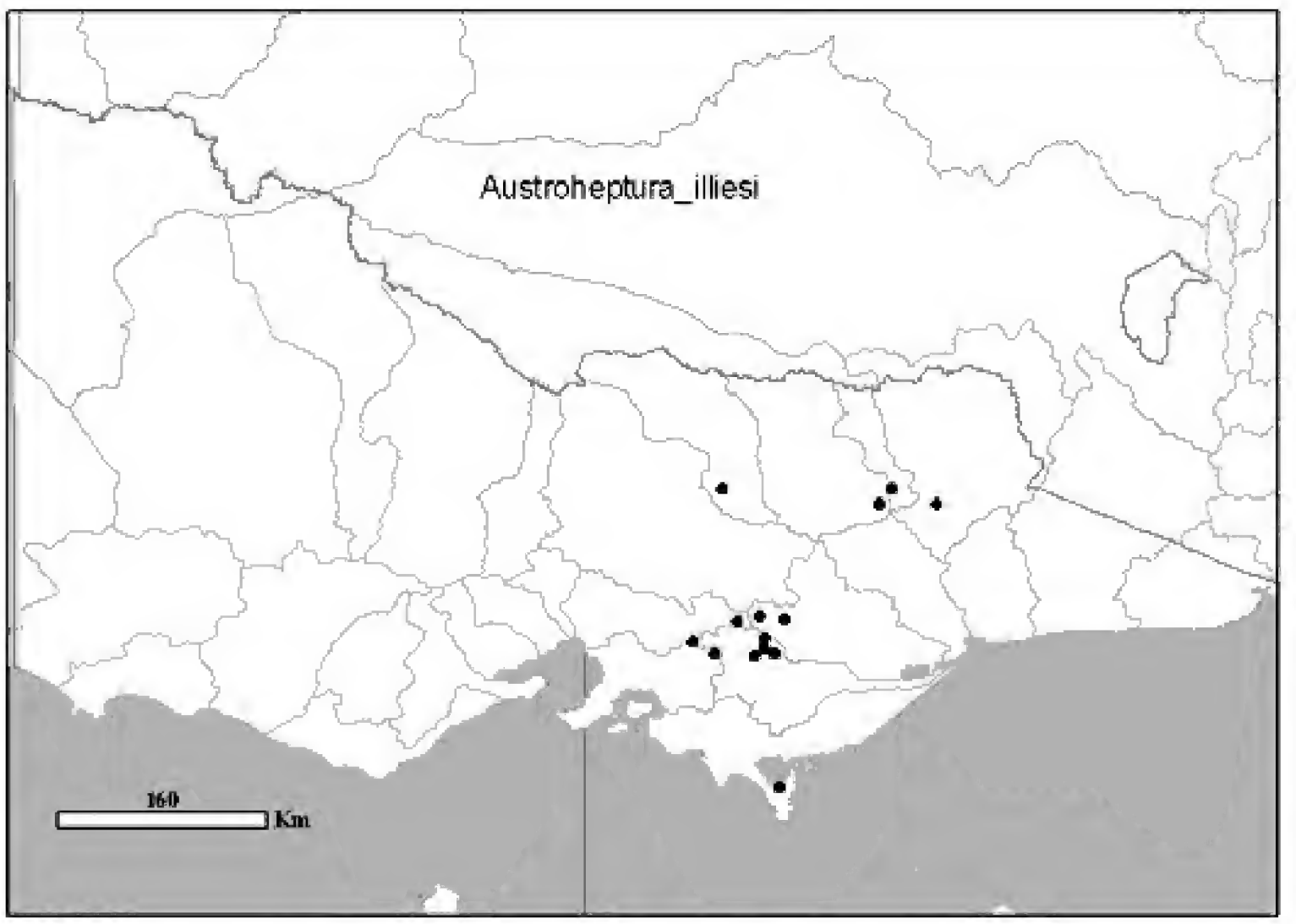
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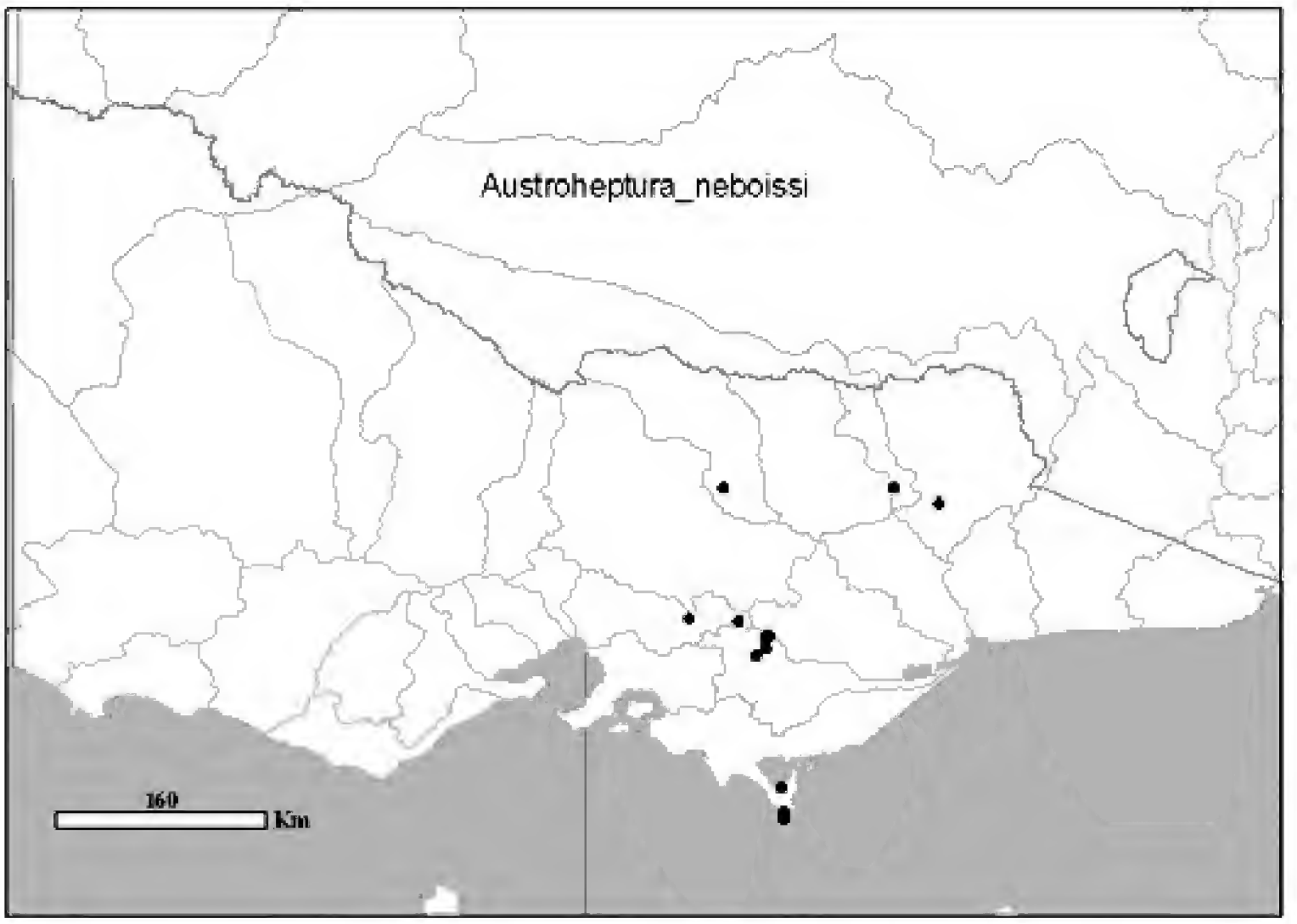
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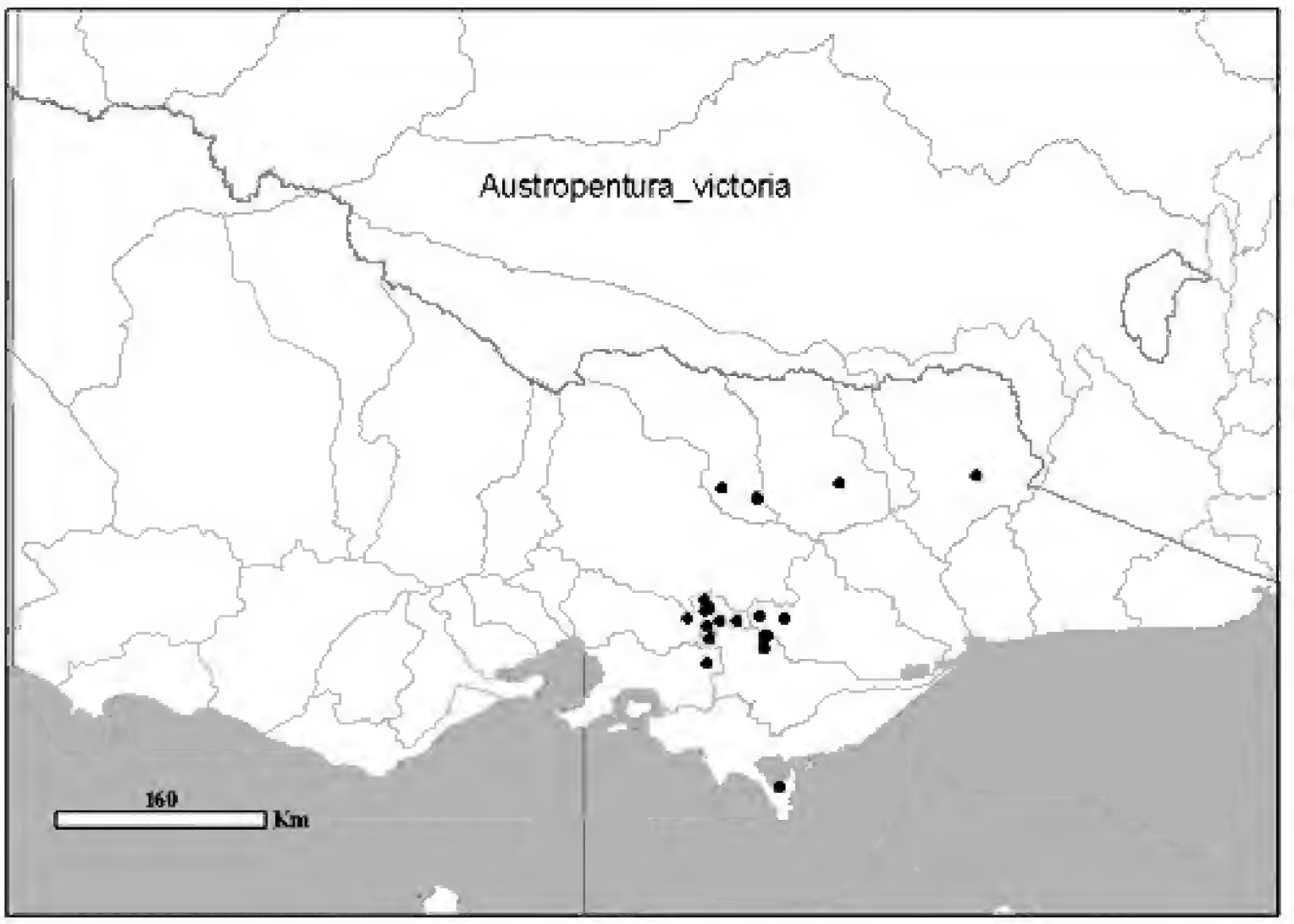
Austropentura_victoria
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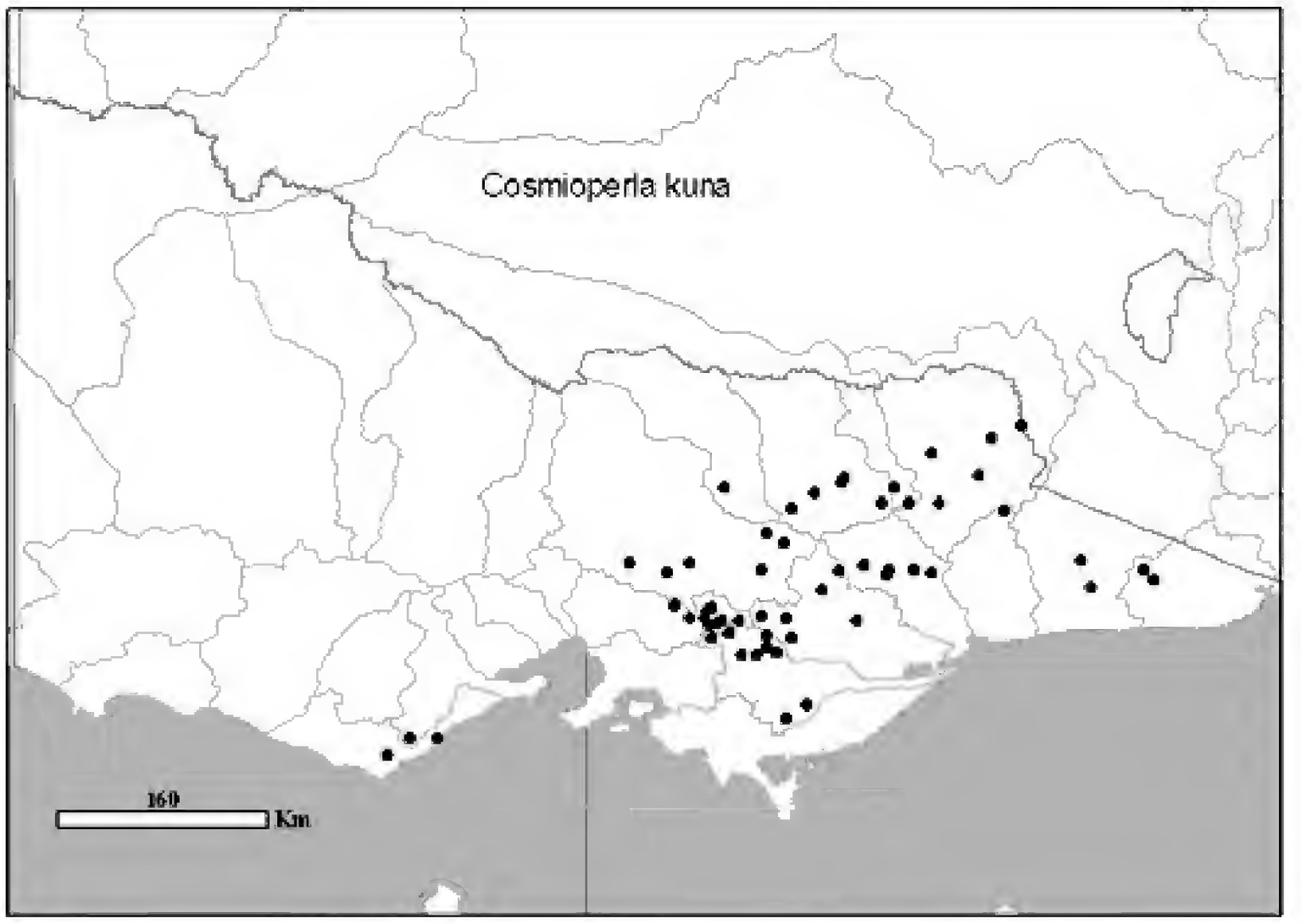
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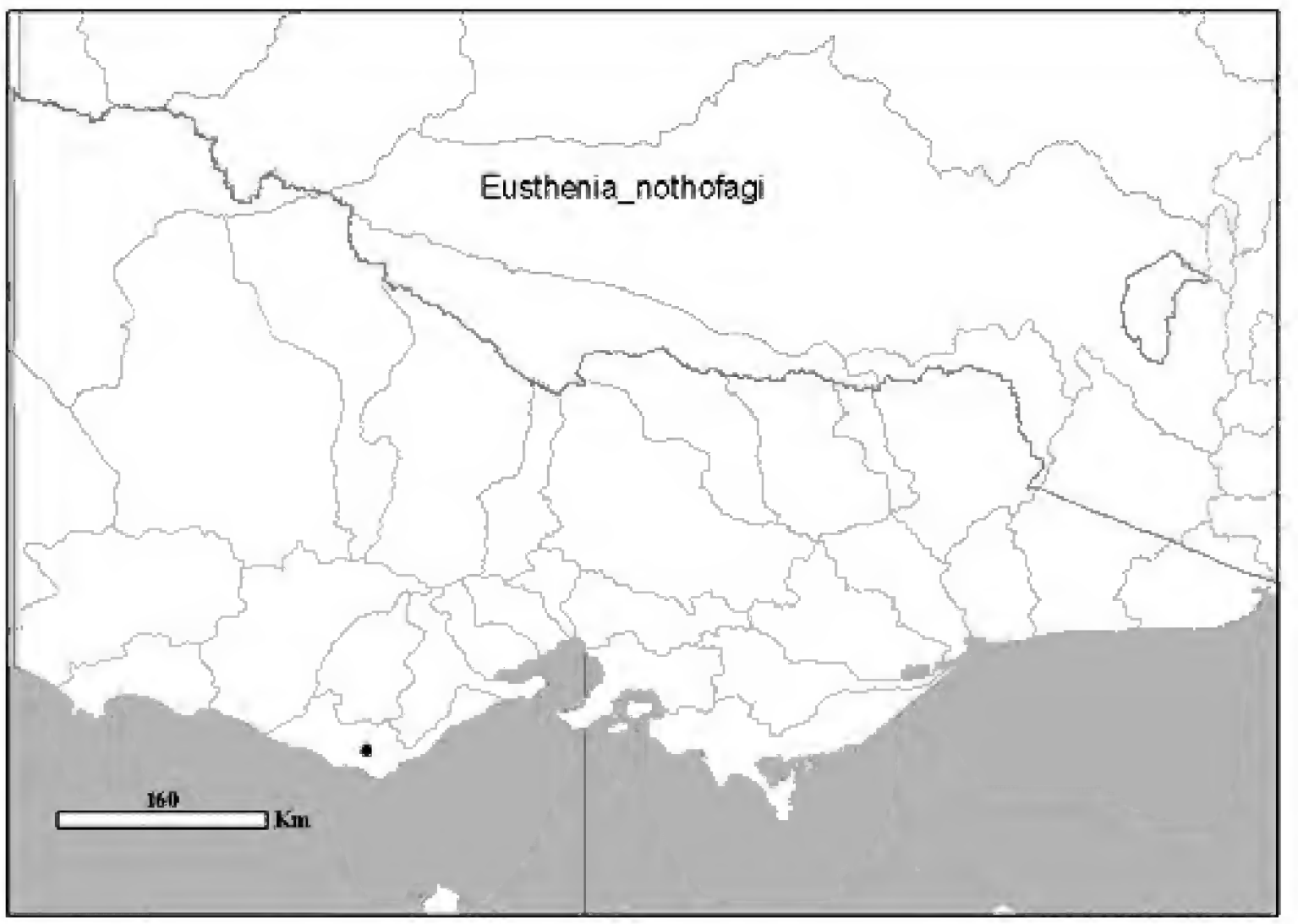
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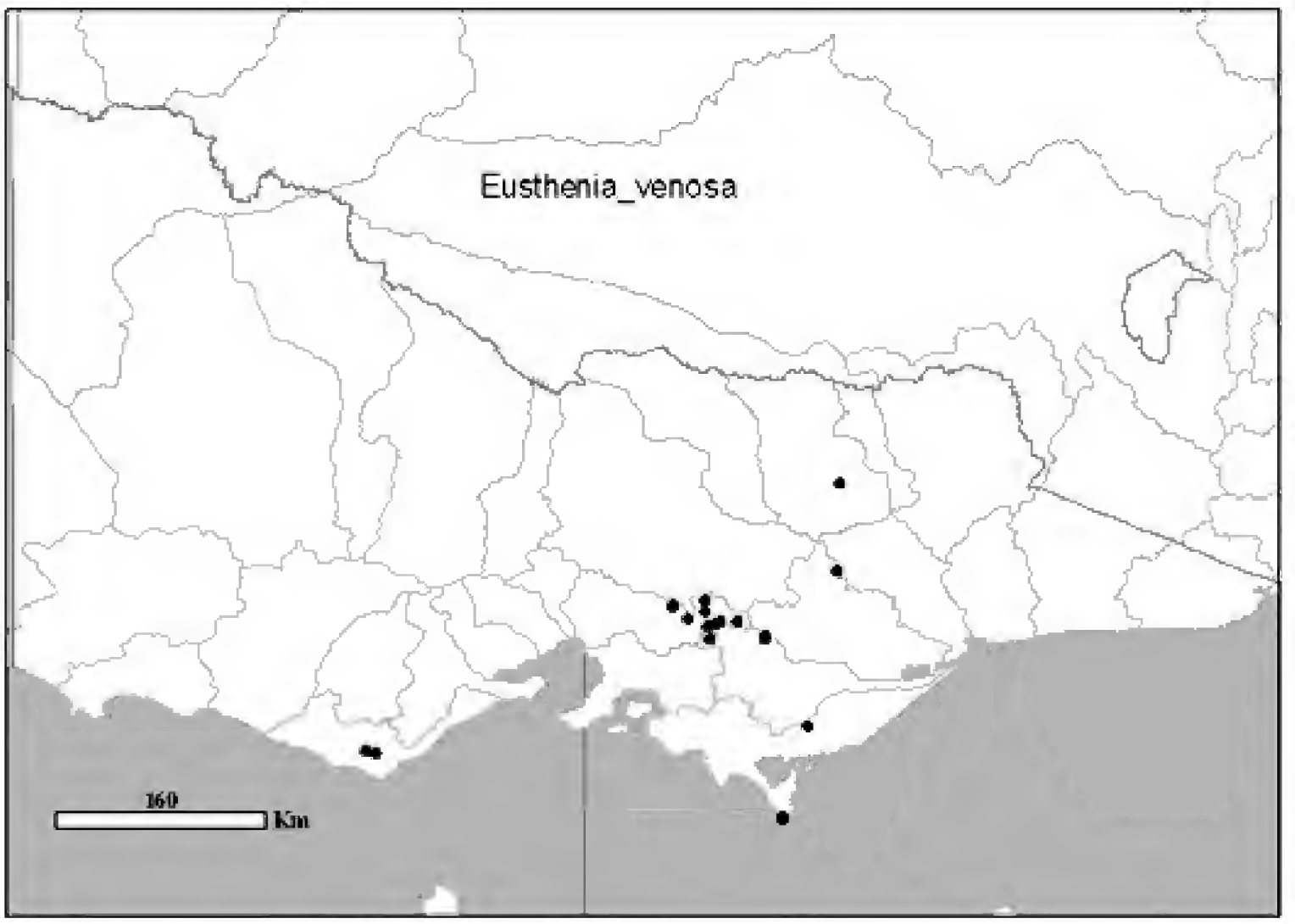
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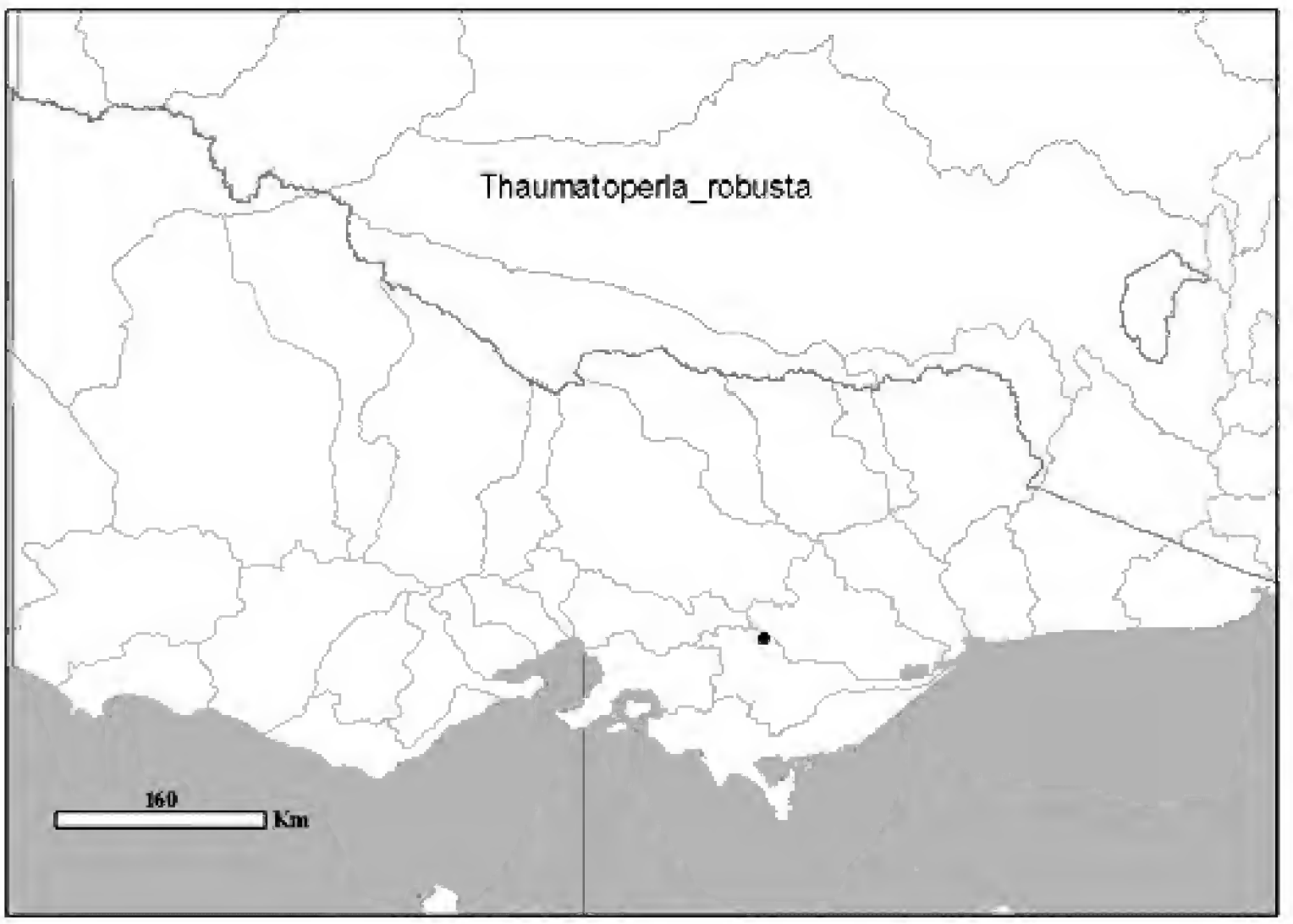
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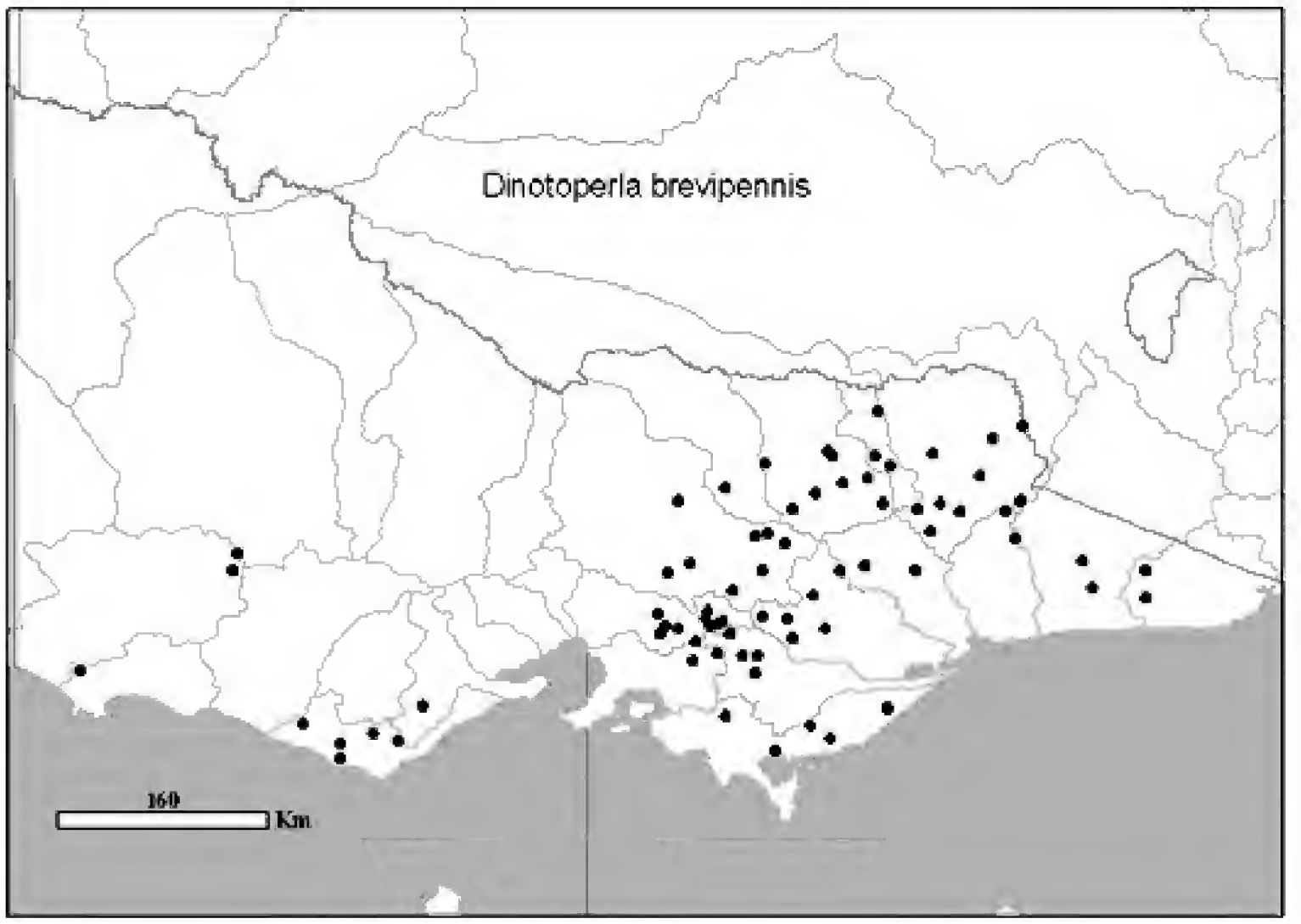
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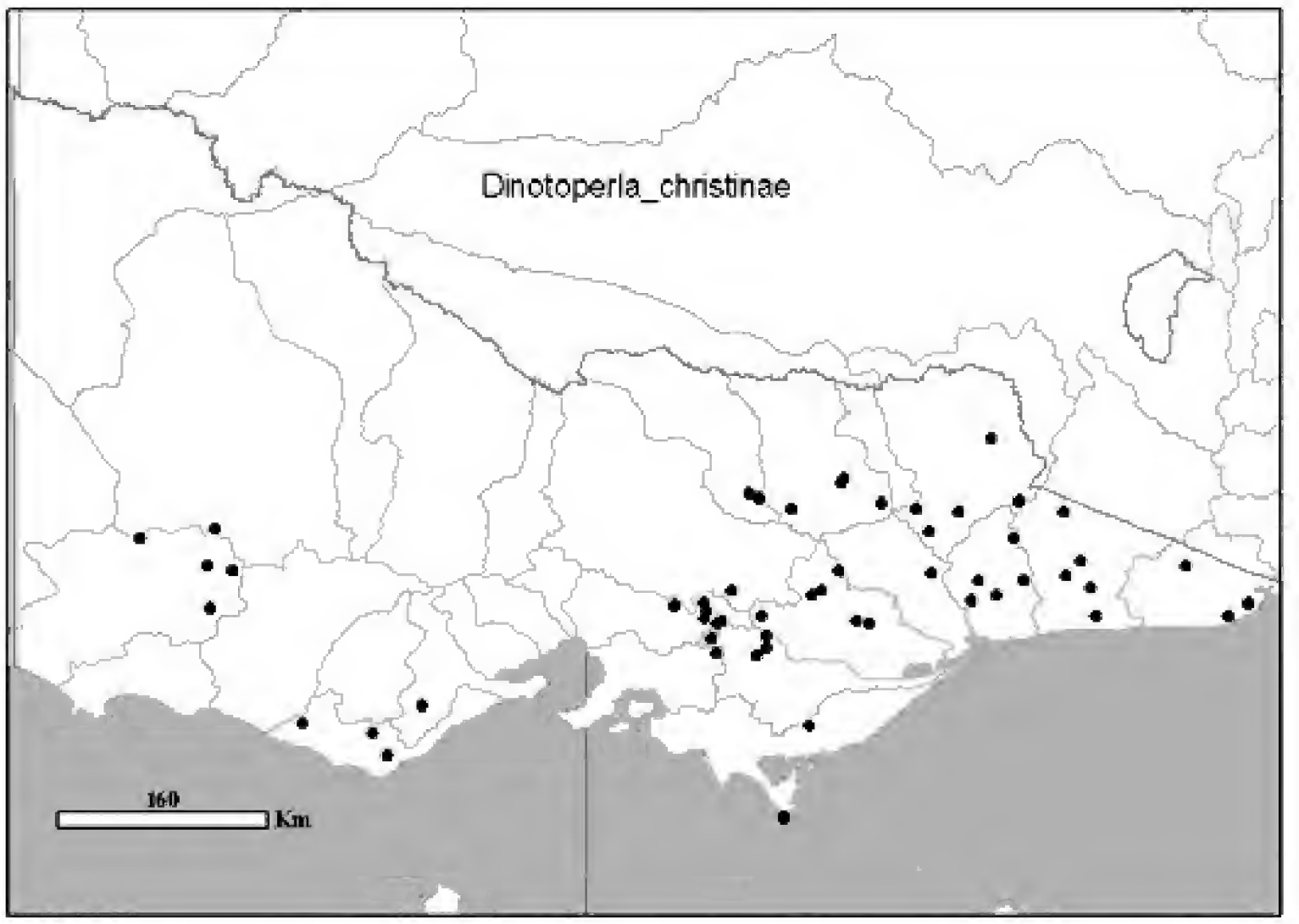
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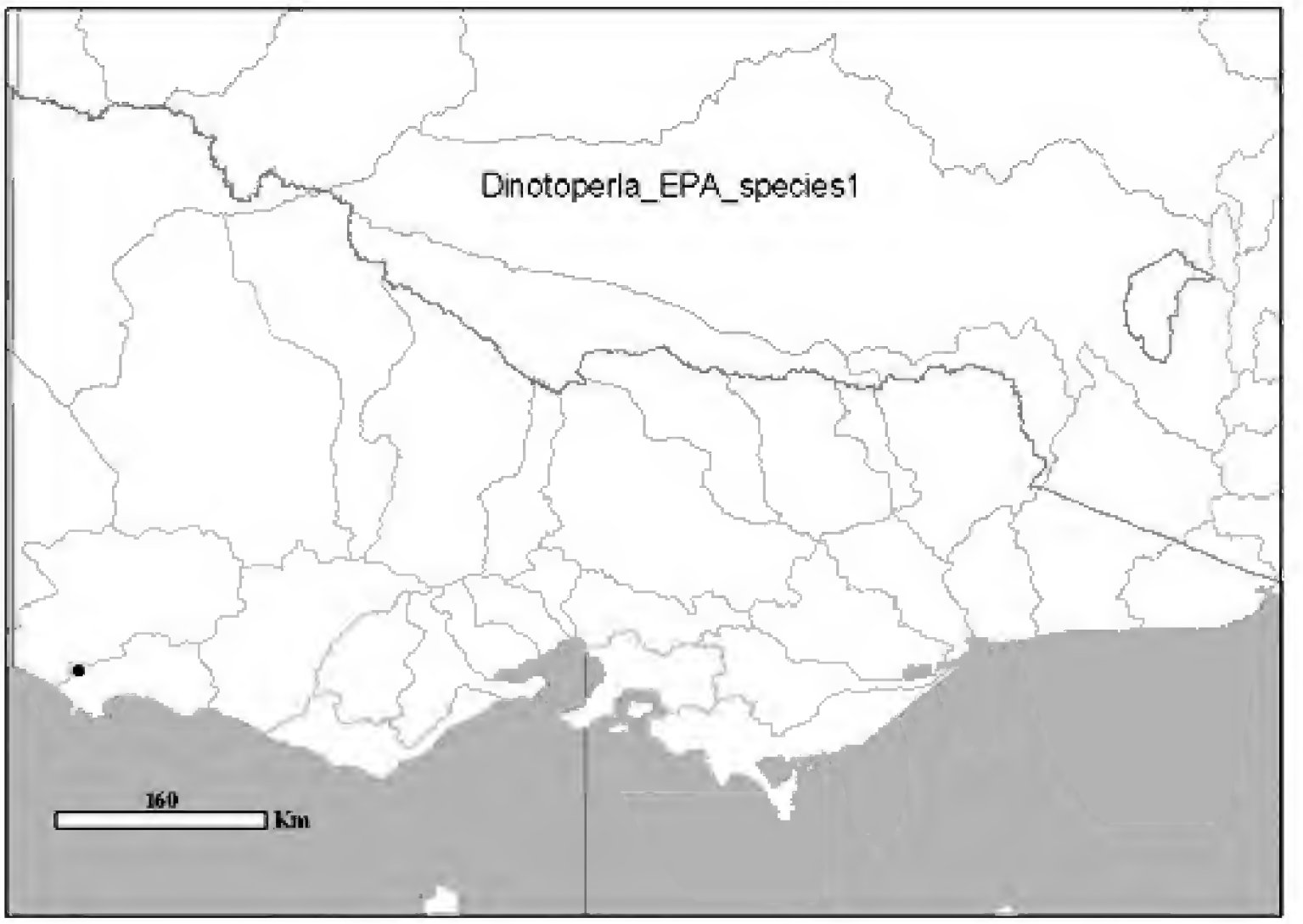
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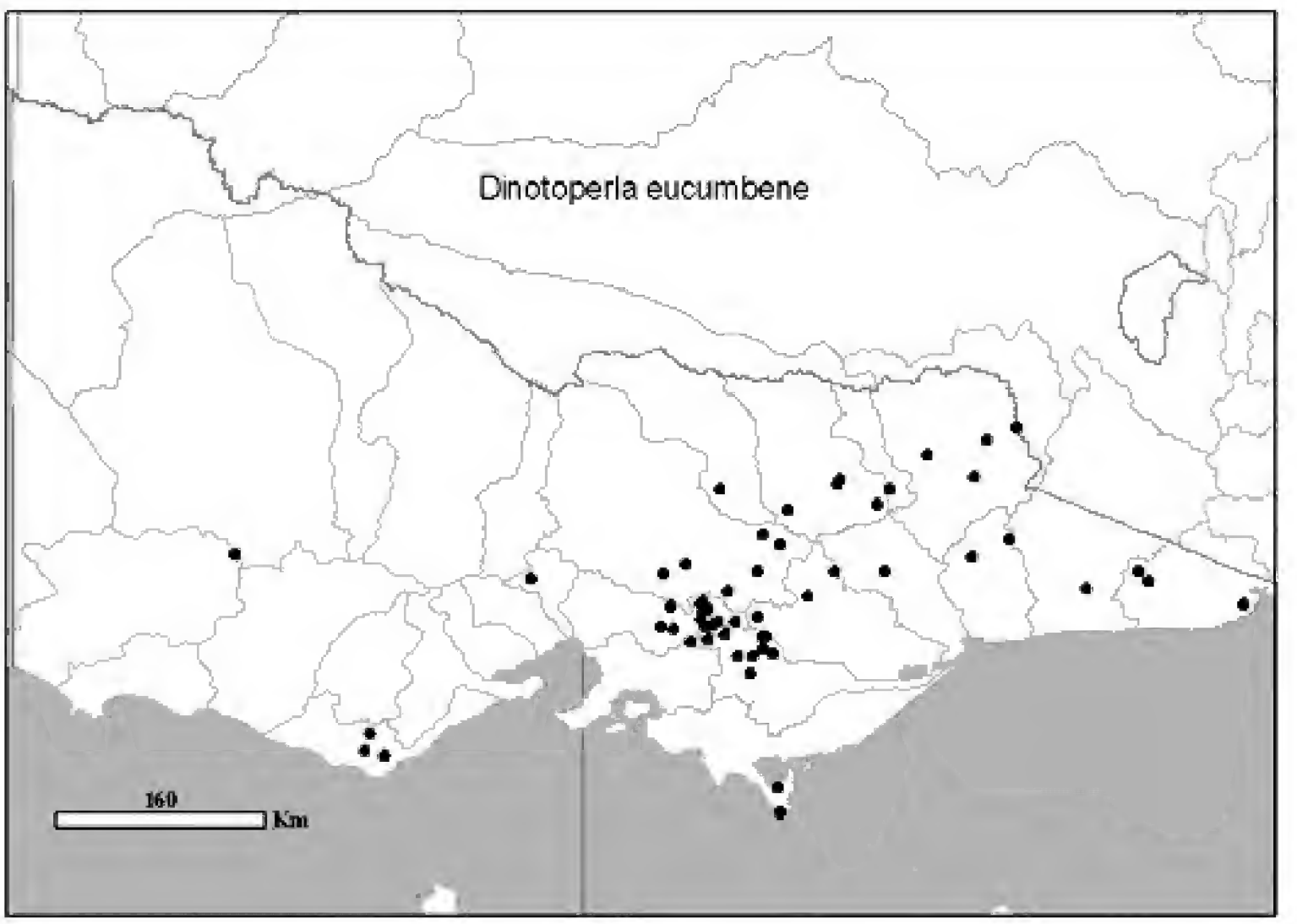
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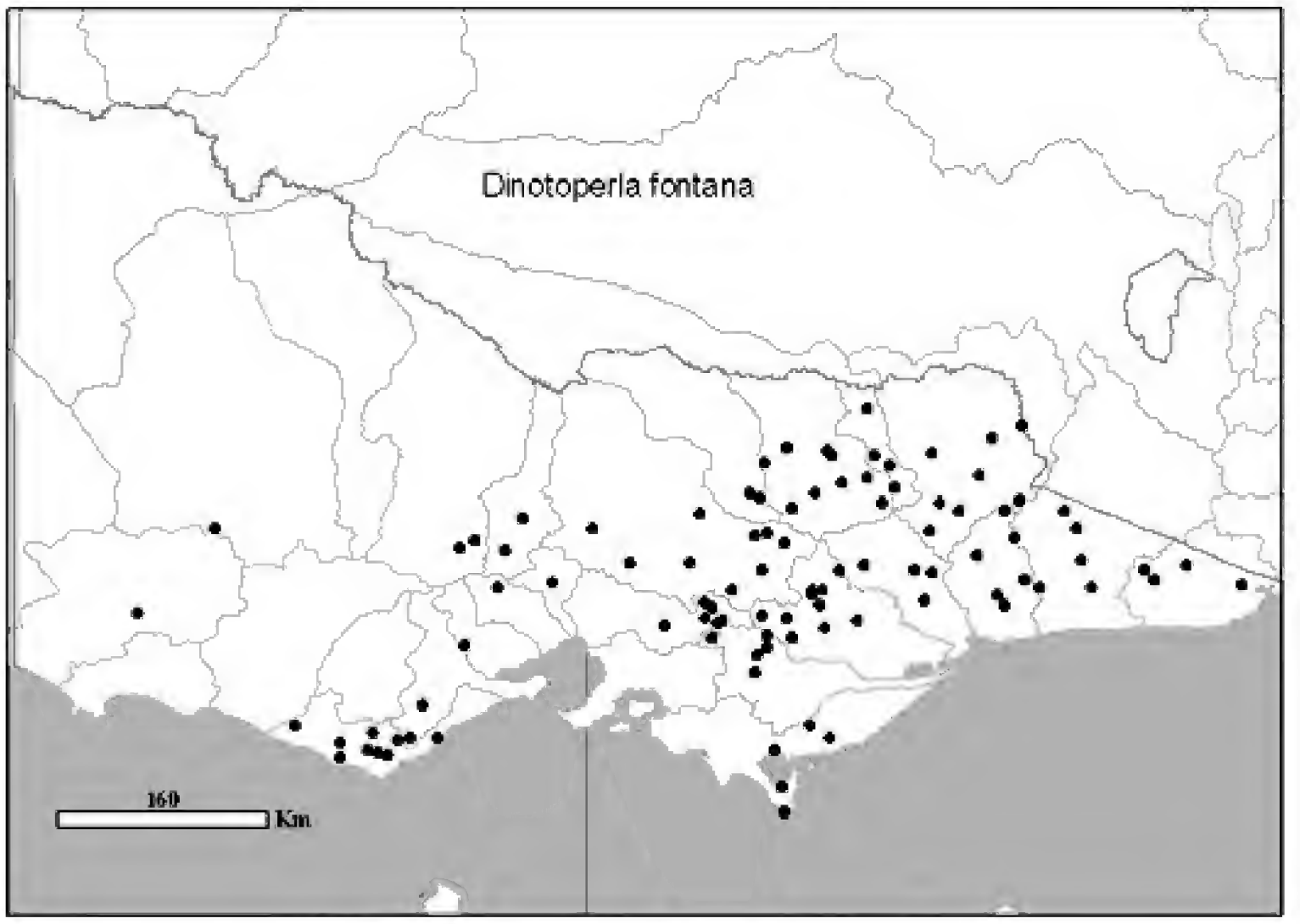
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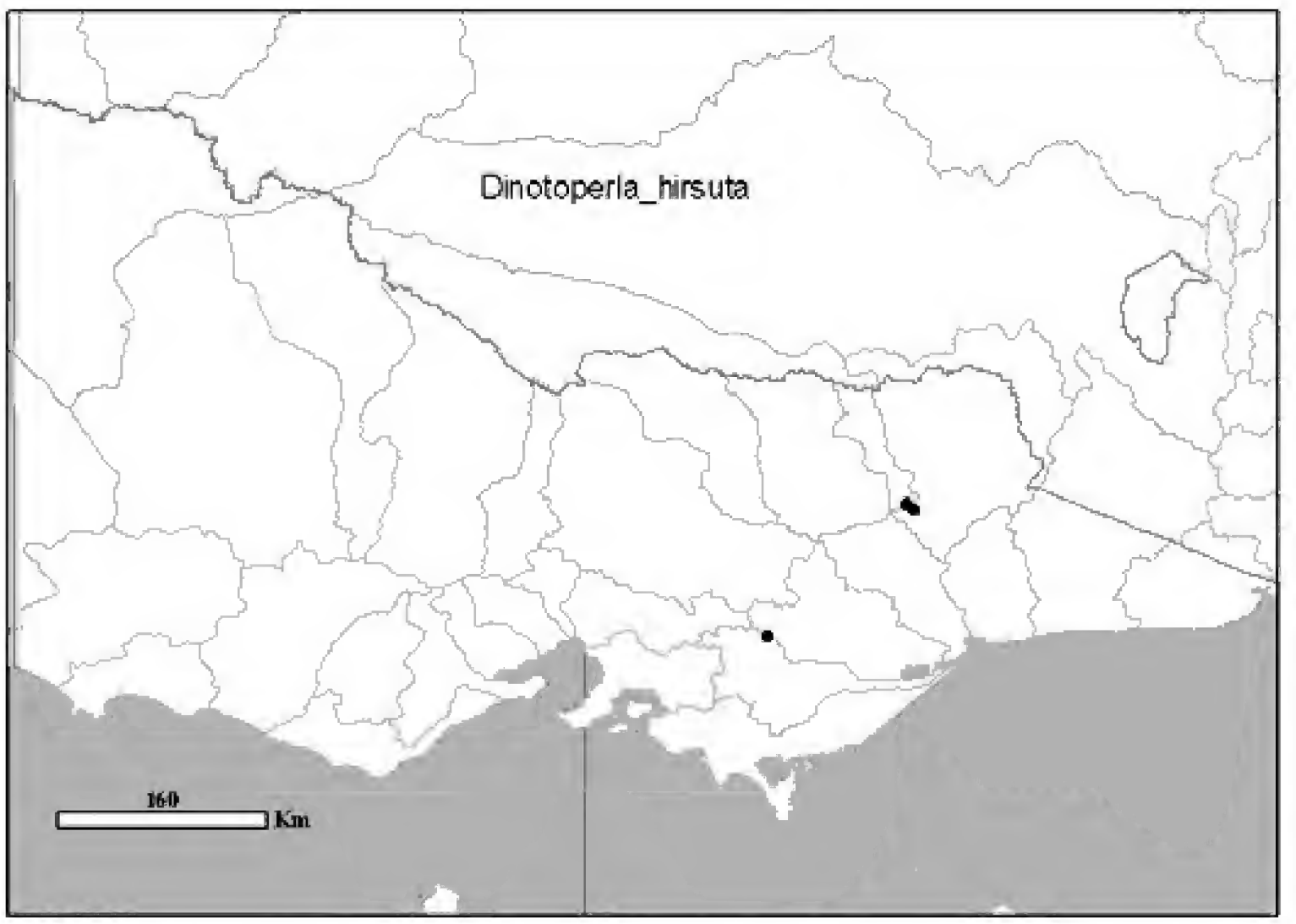
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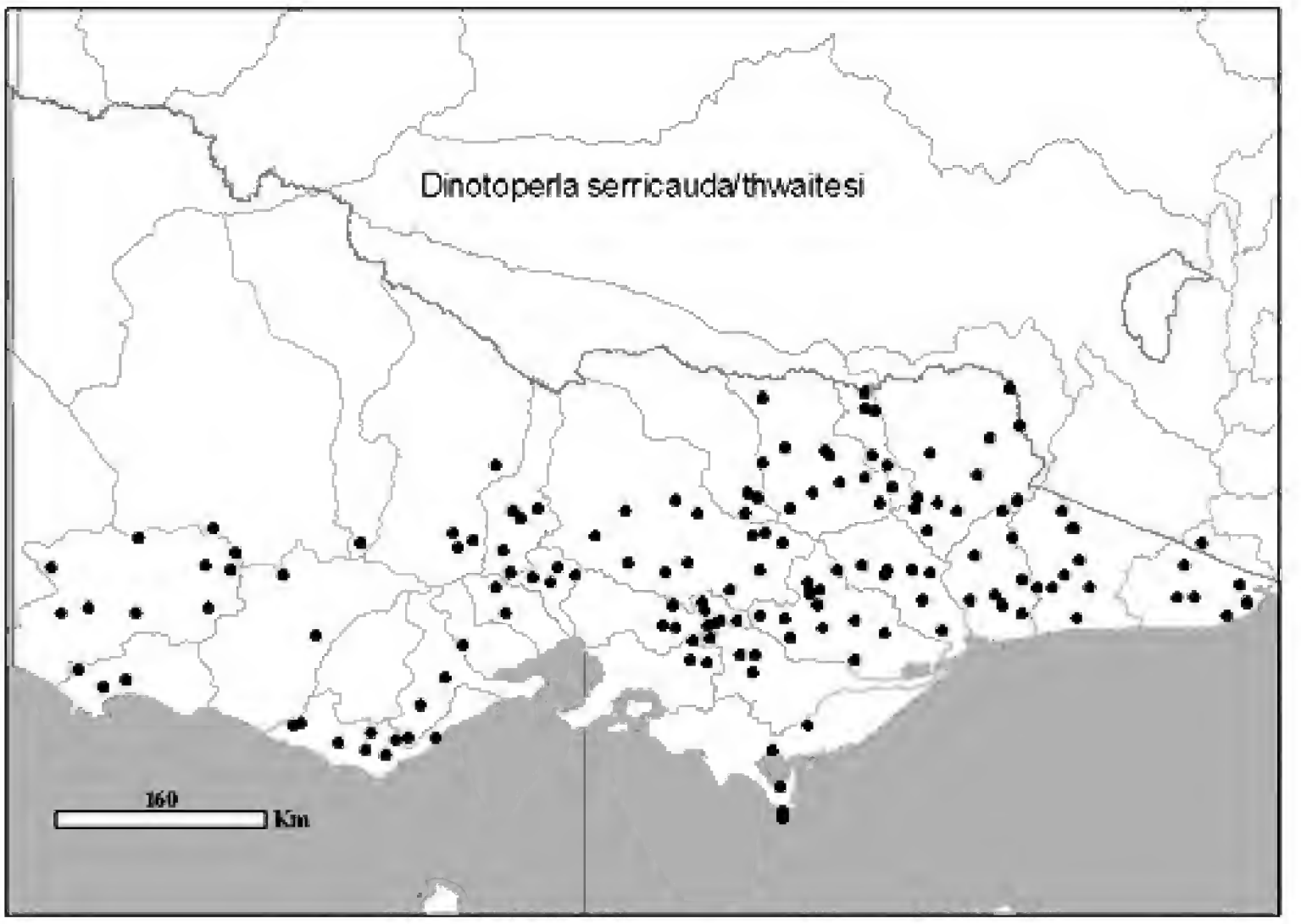
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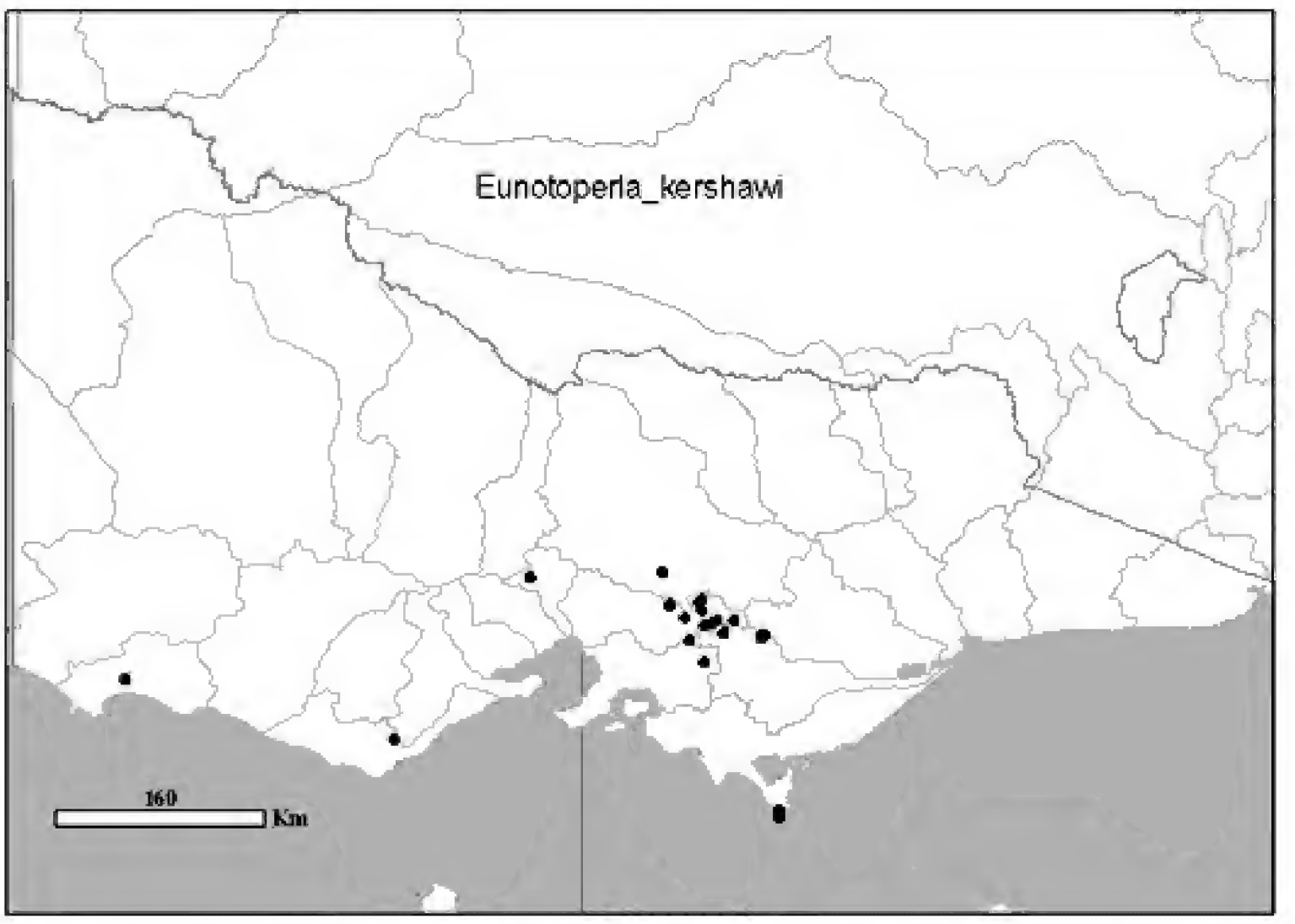
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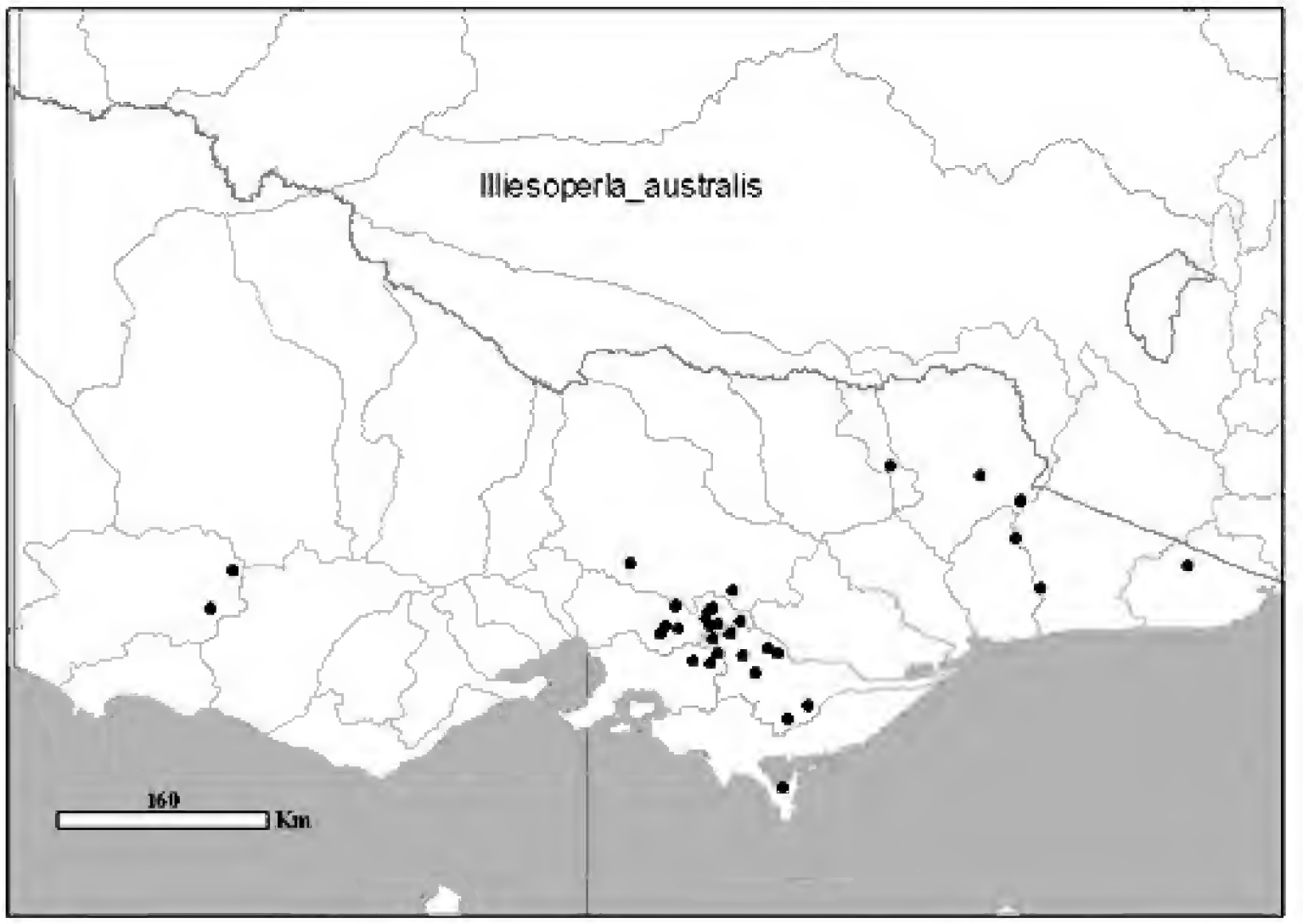
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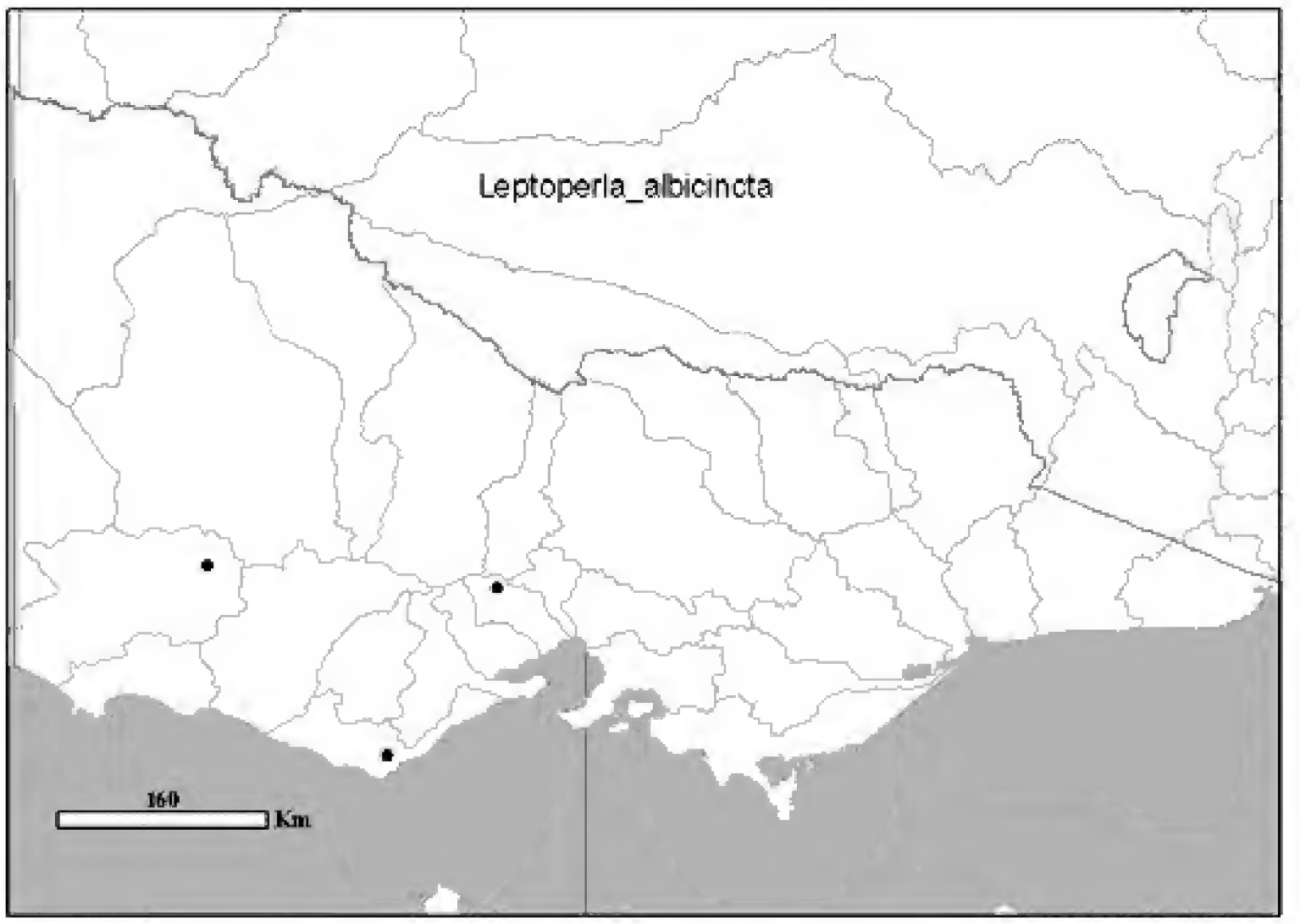
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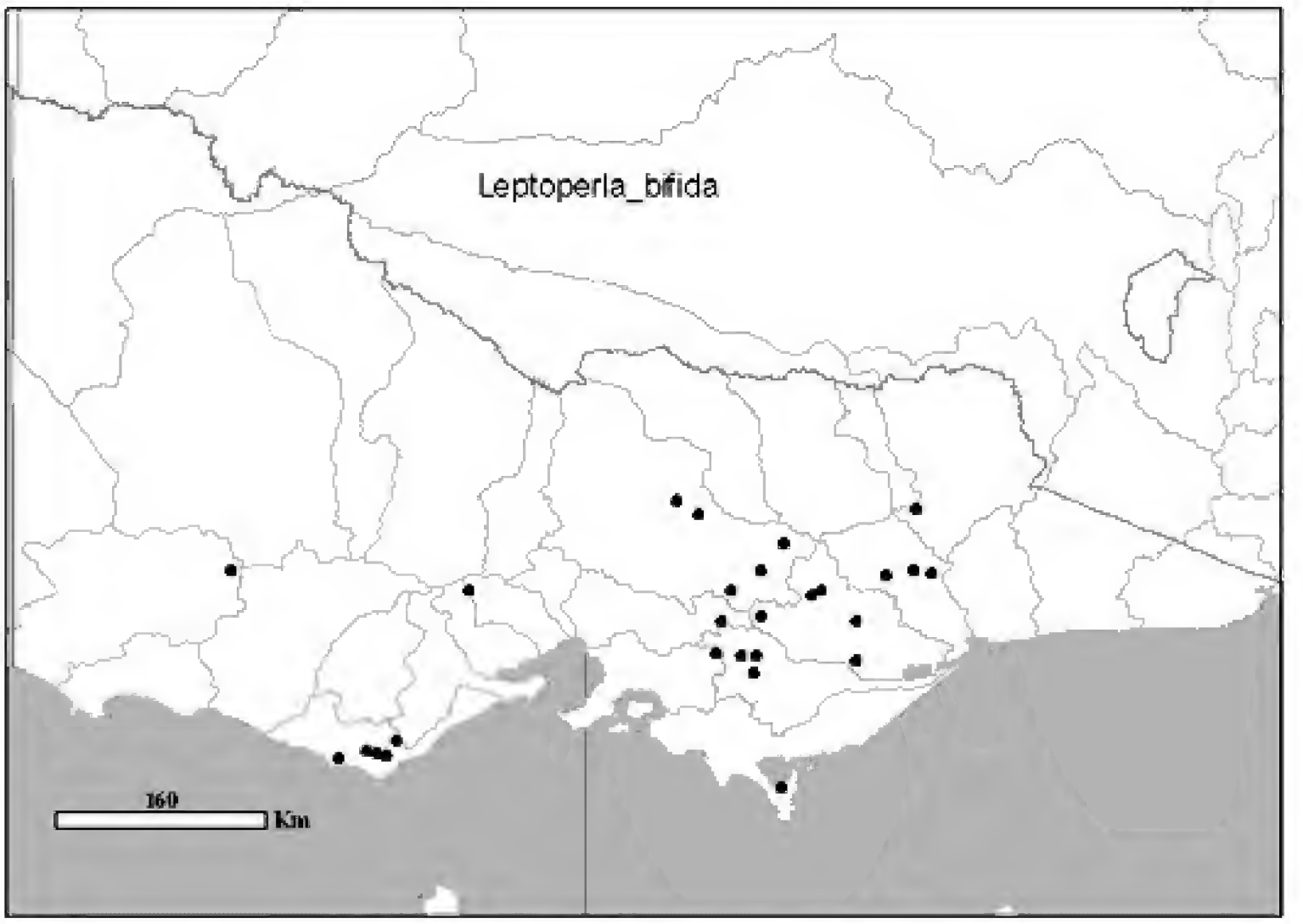
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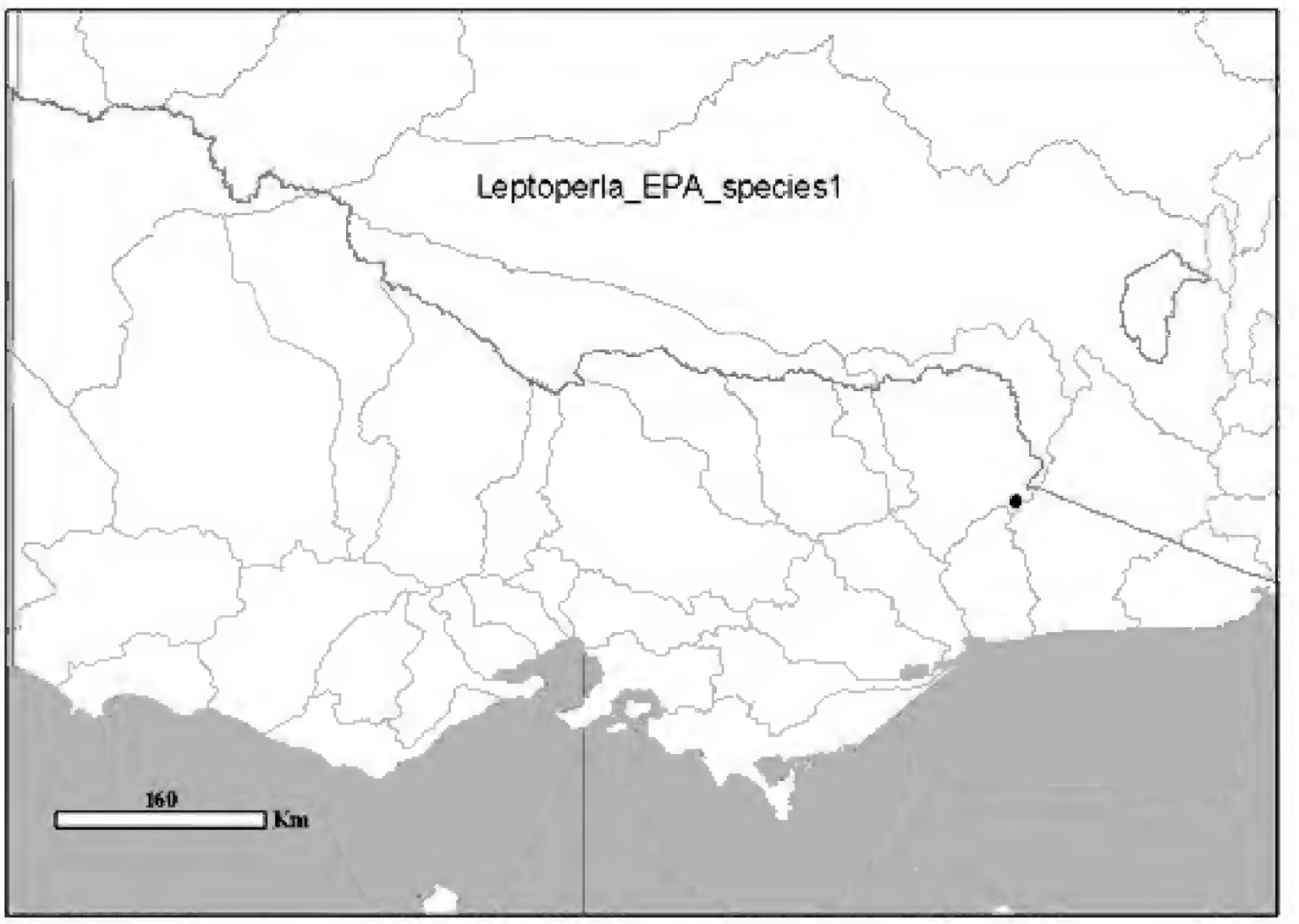
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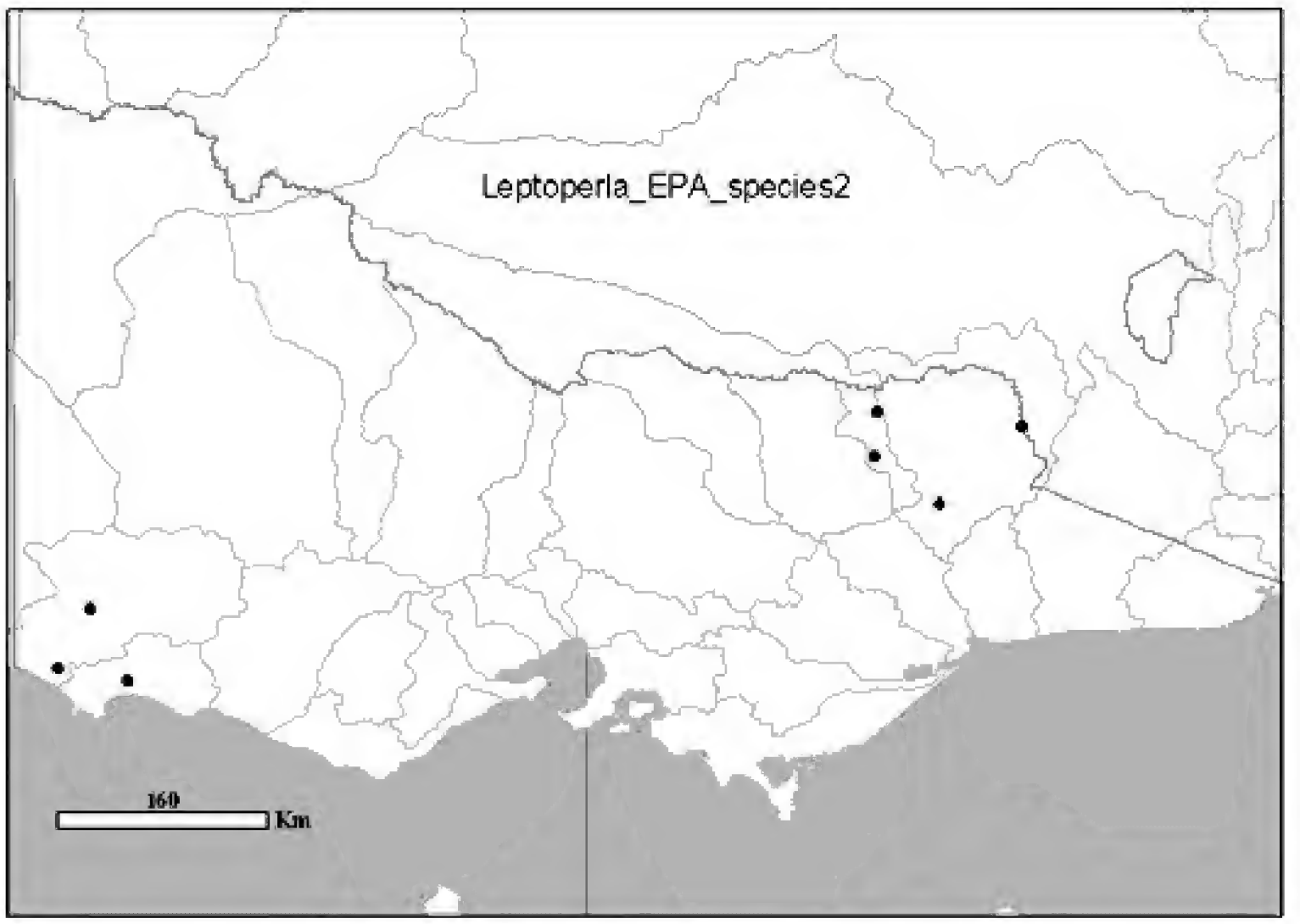
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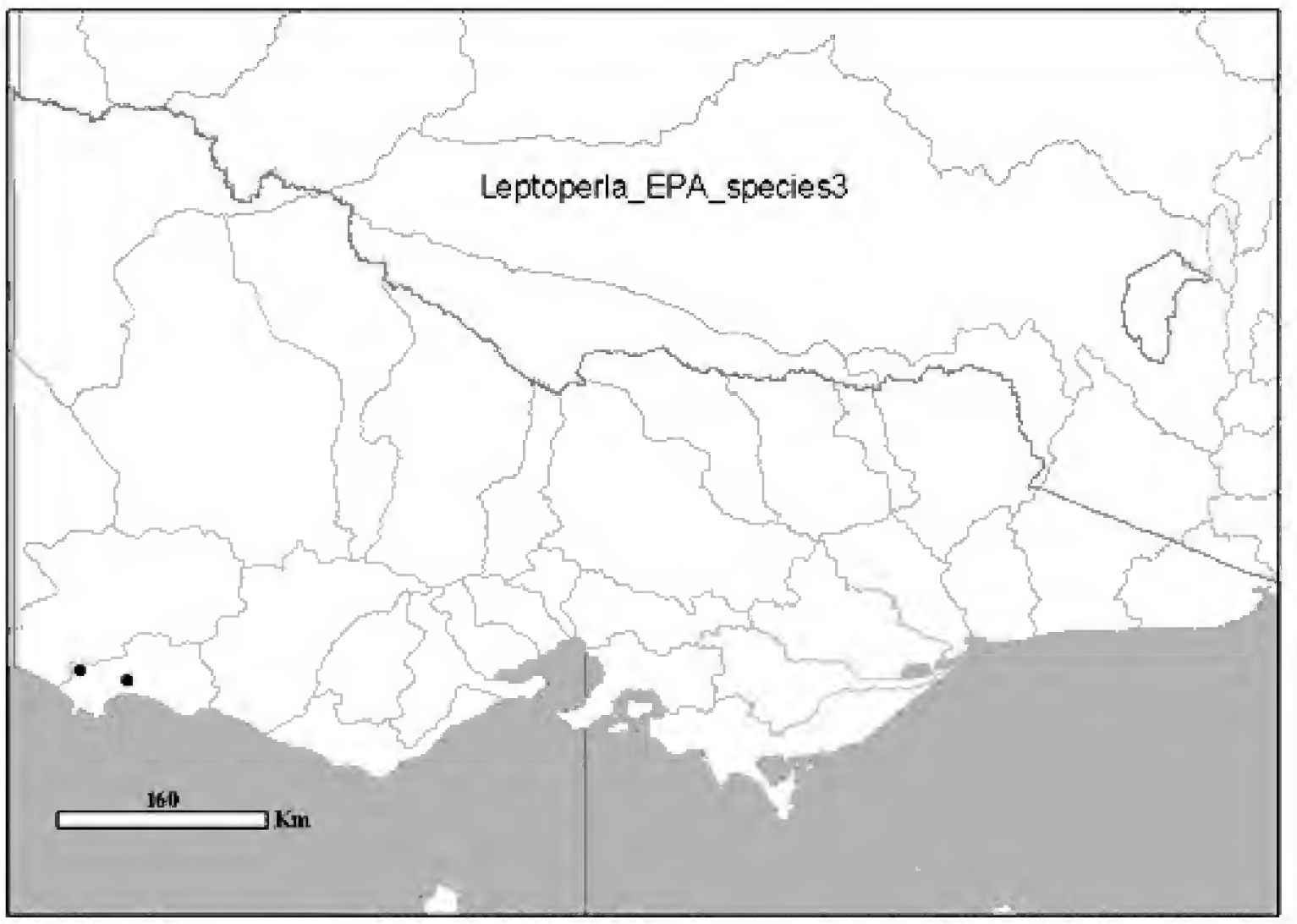
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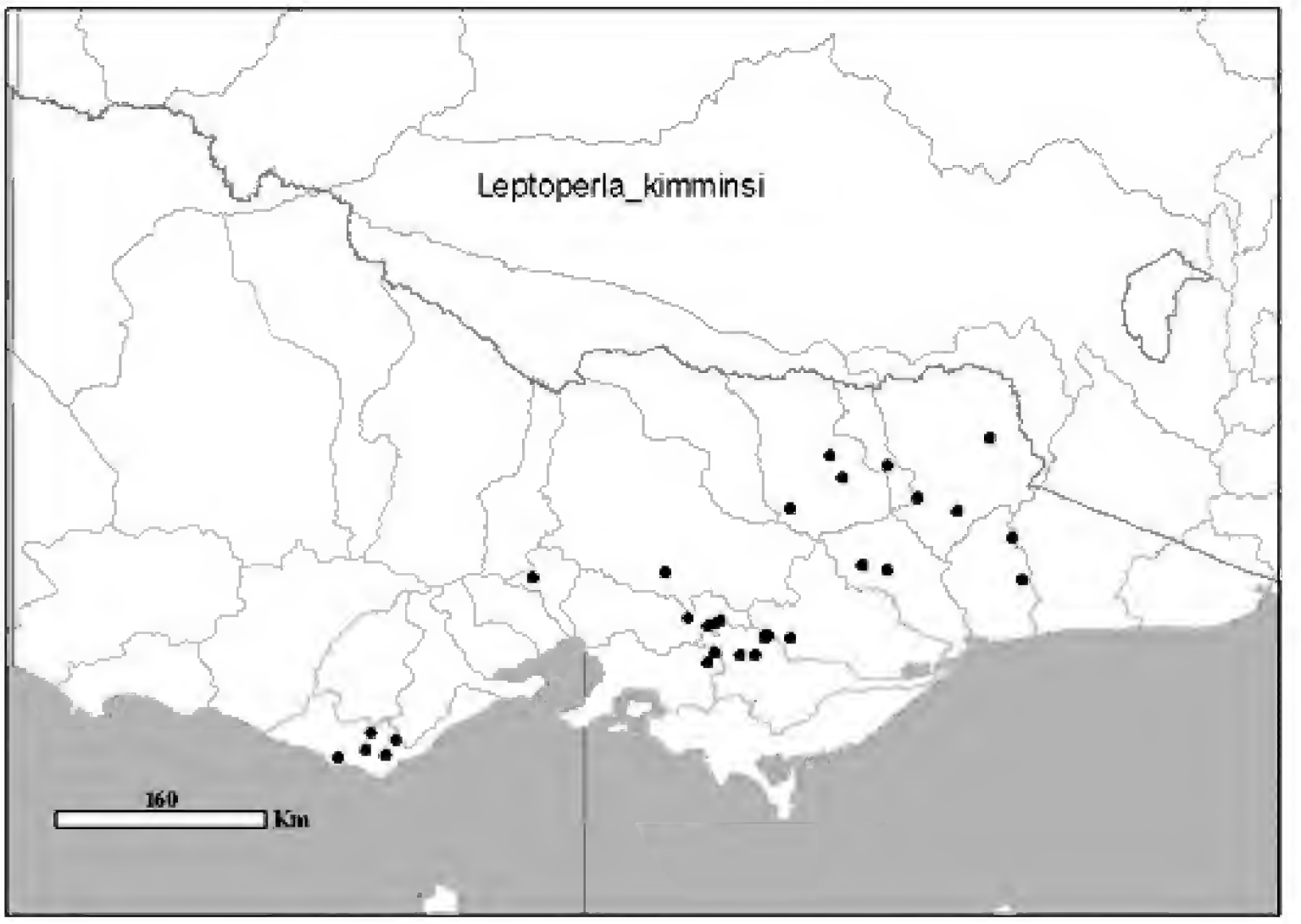
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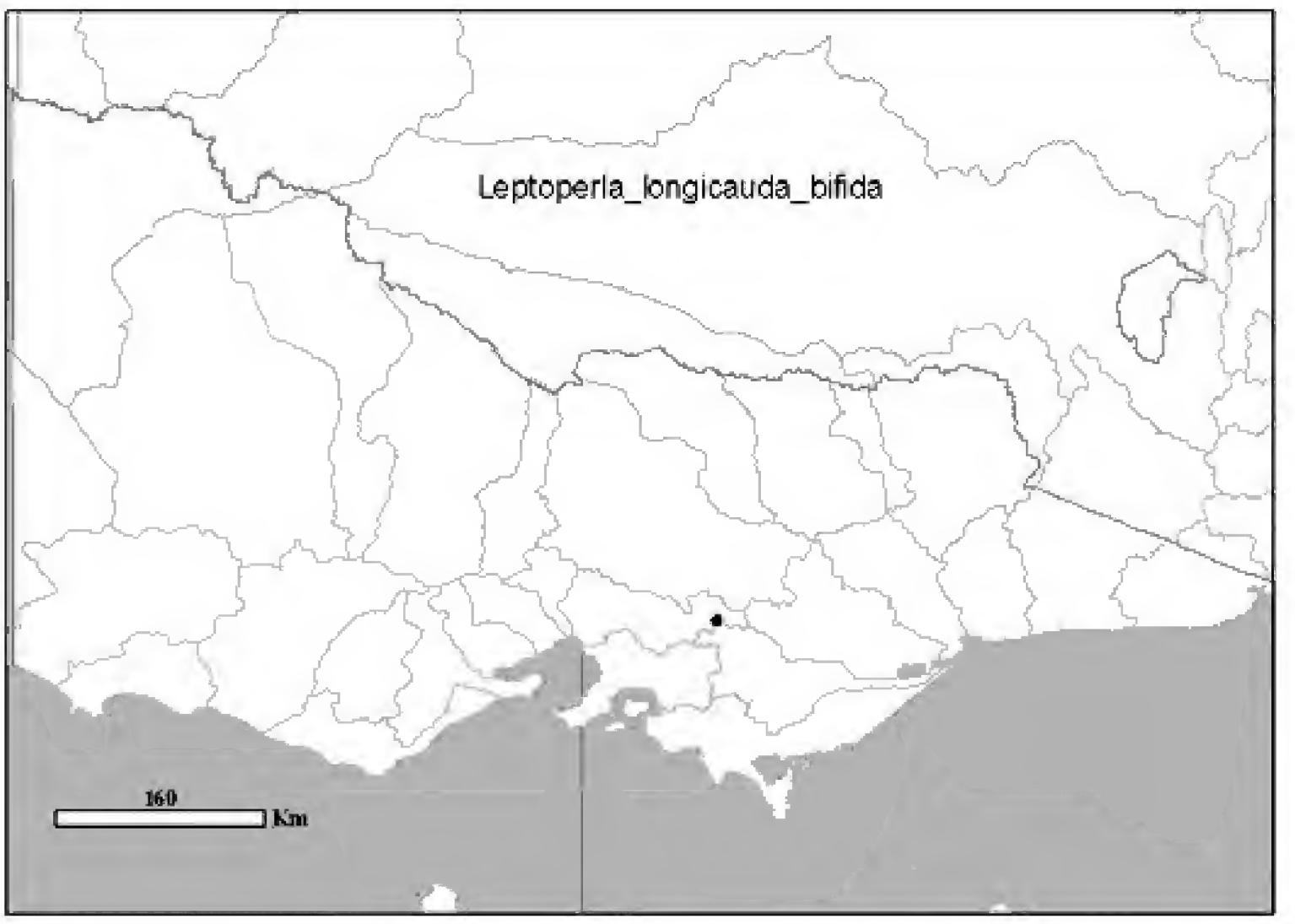
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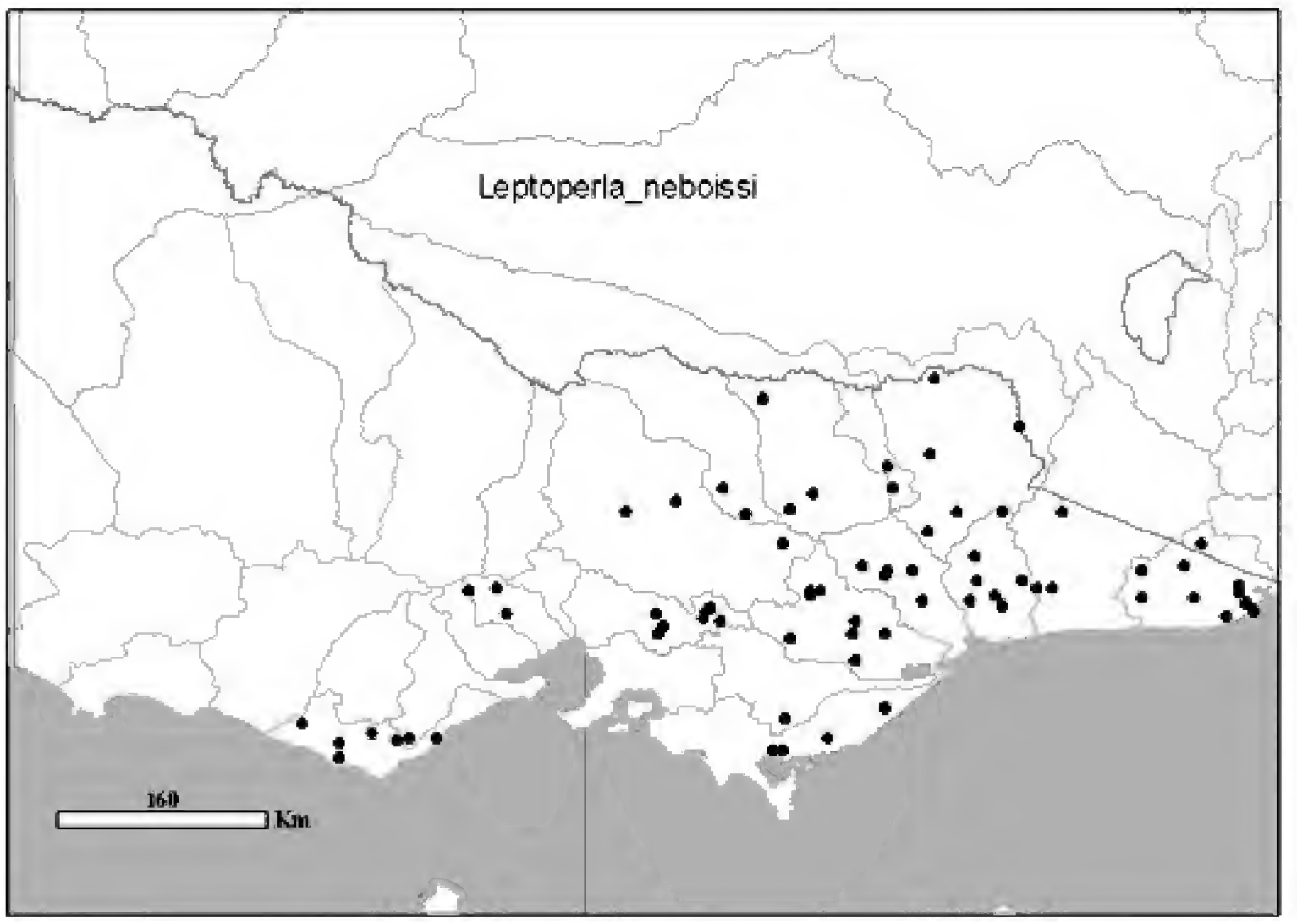
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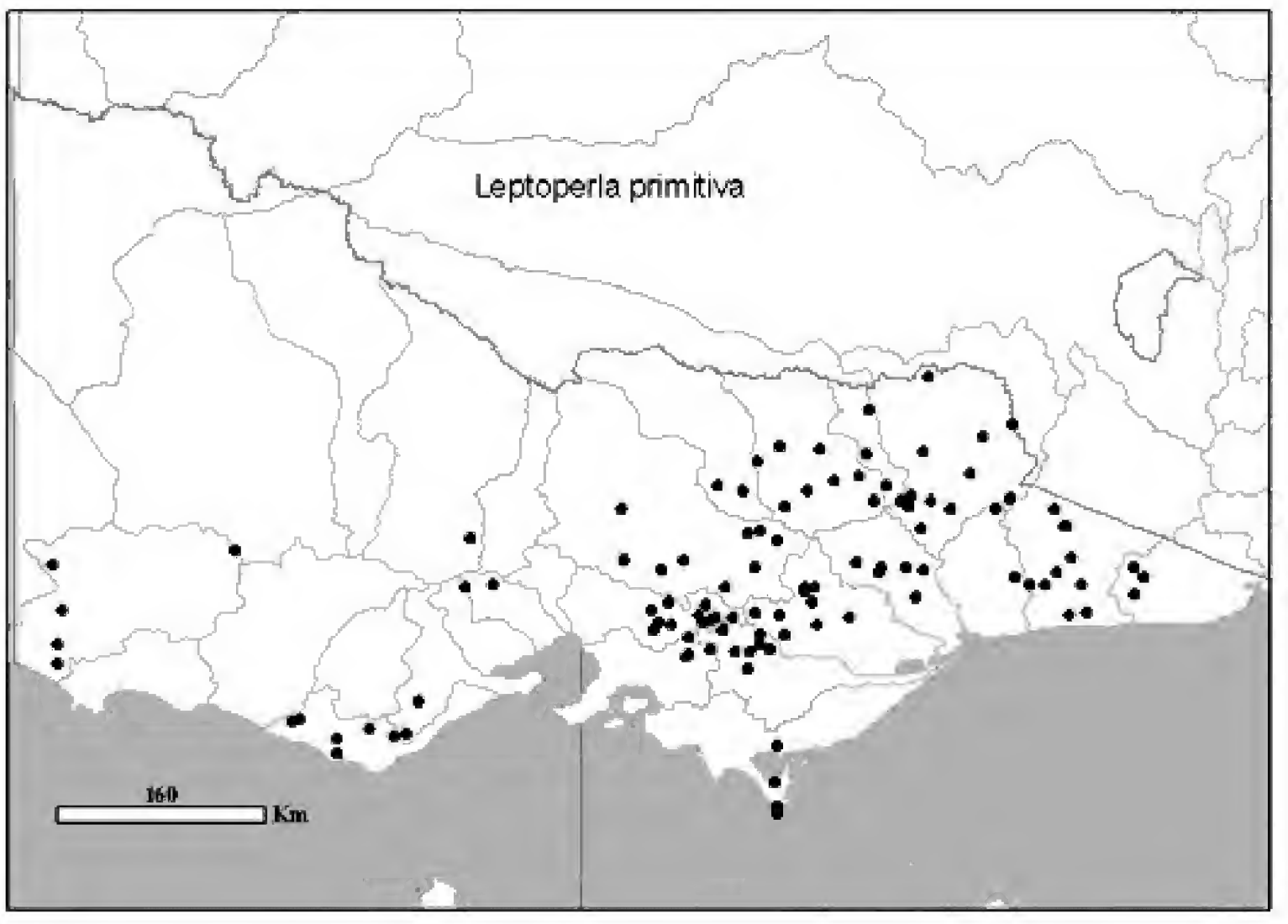
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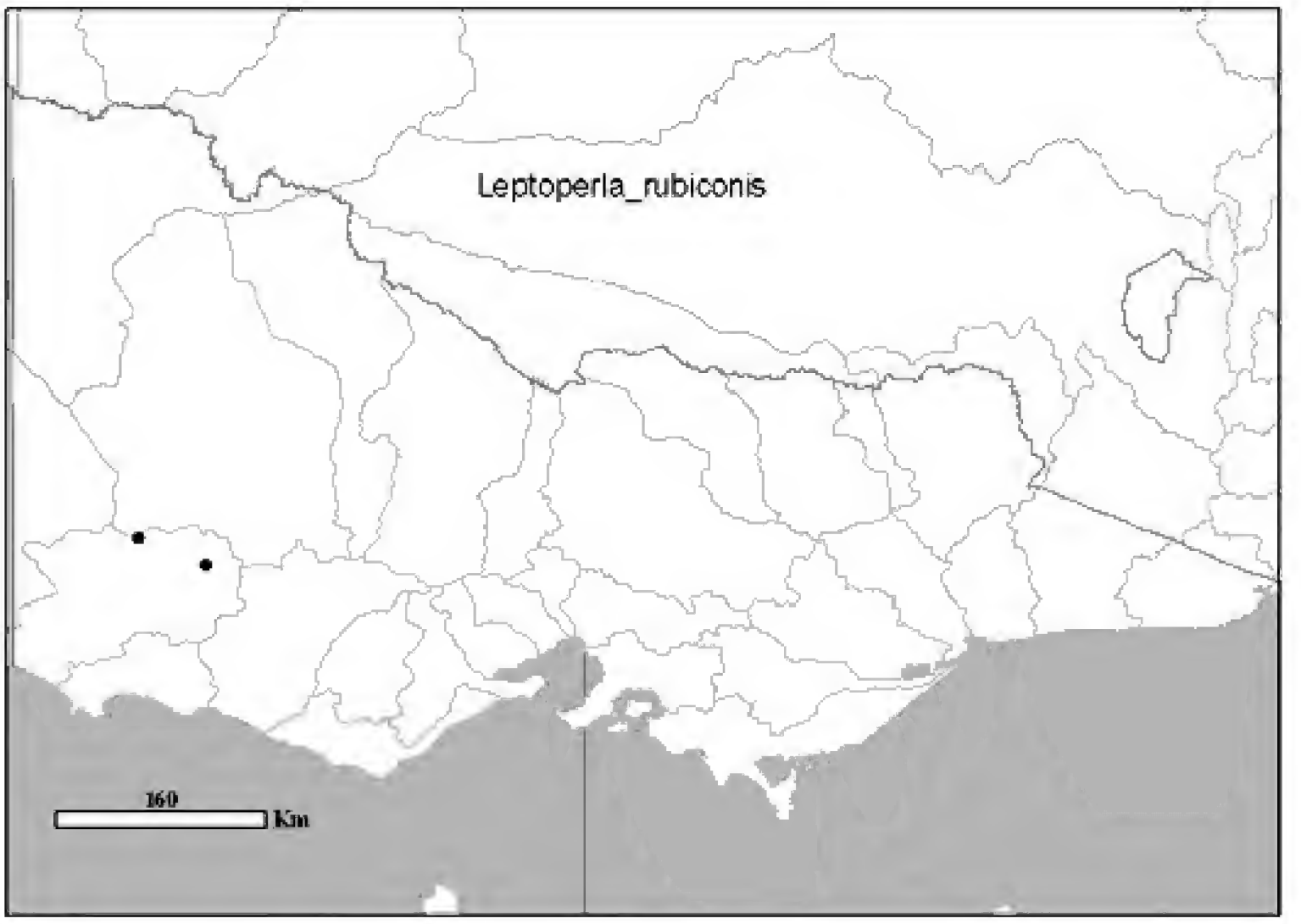
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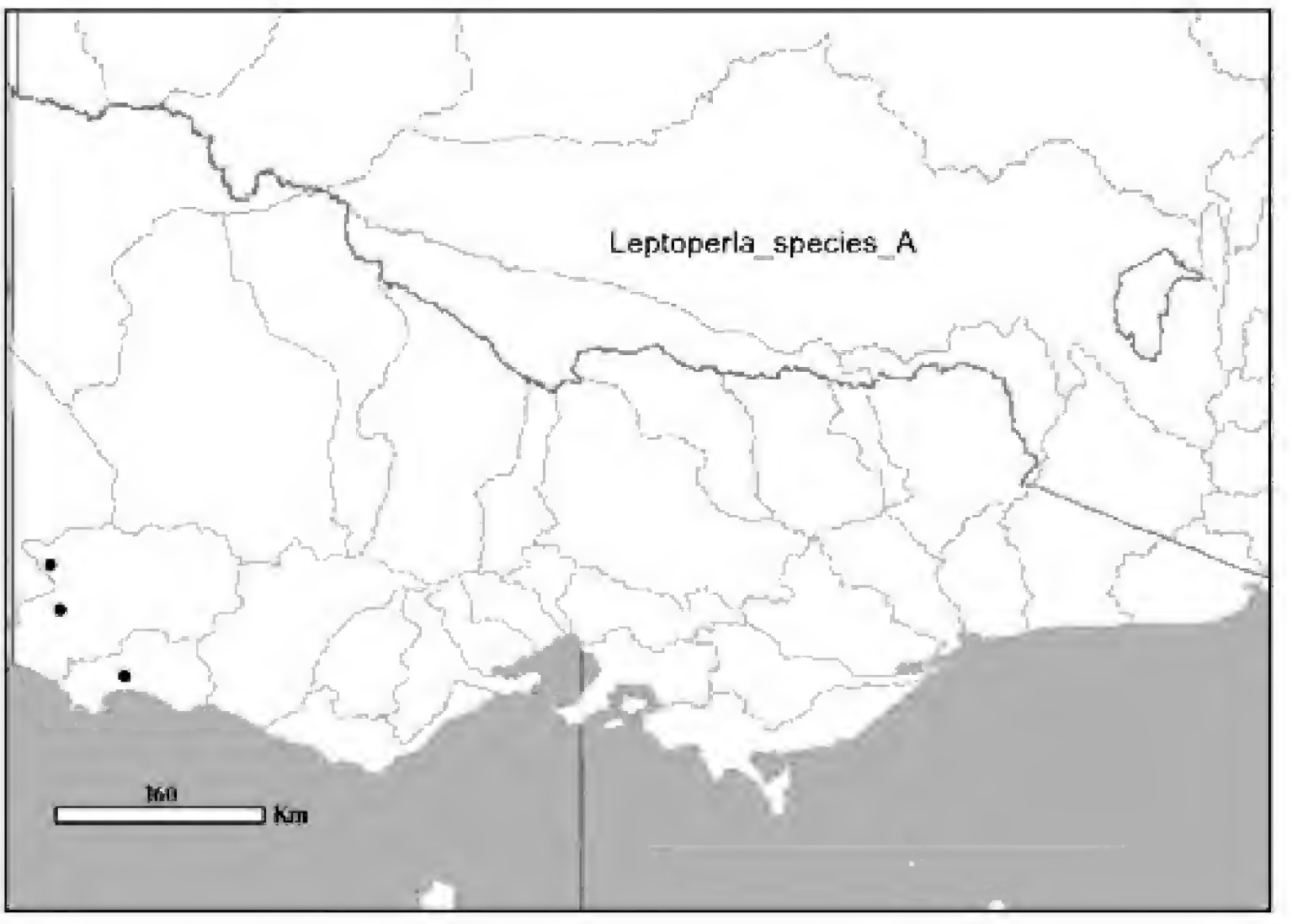
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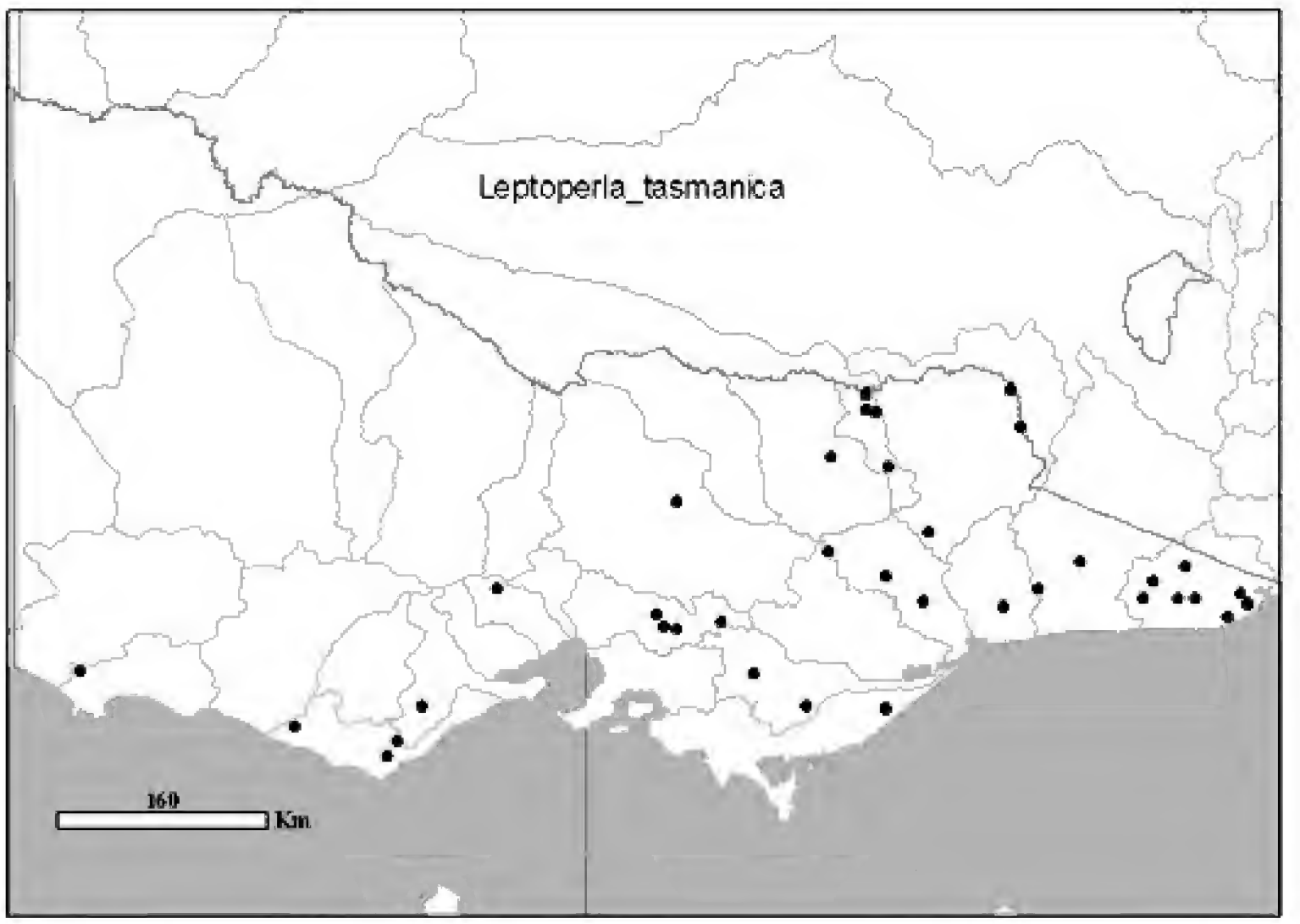
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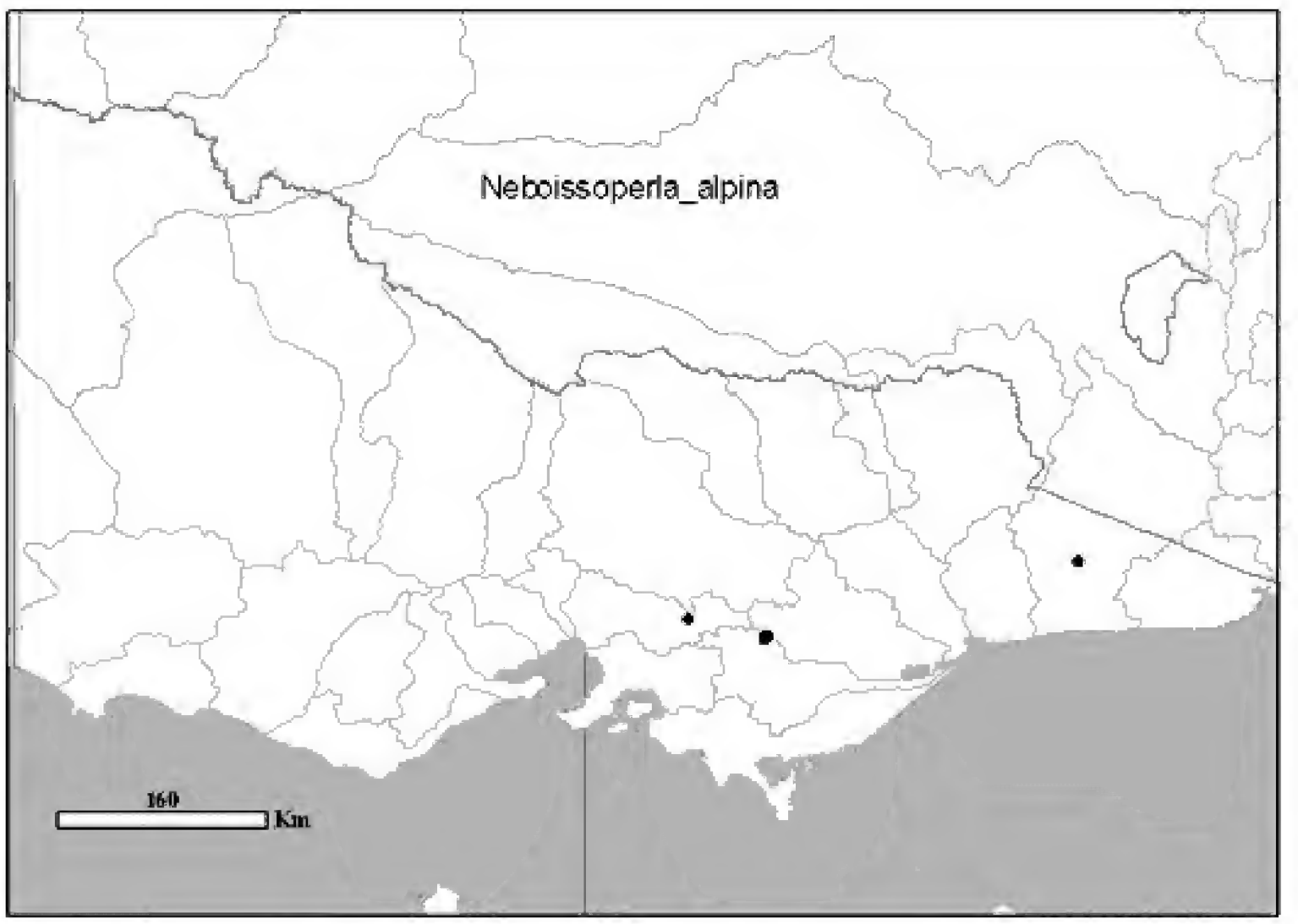
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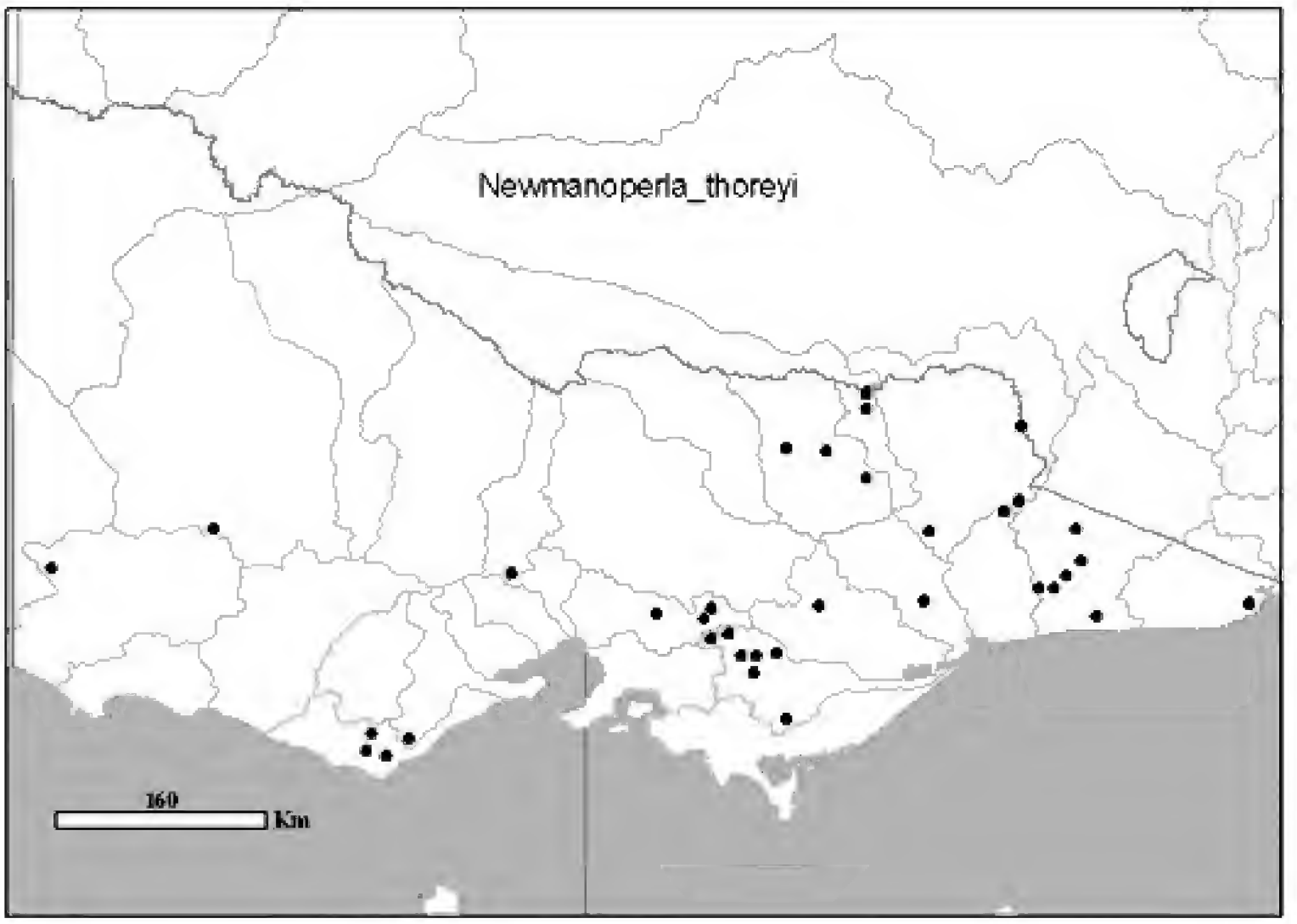
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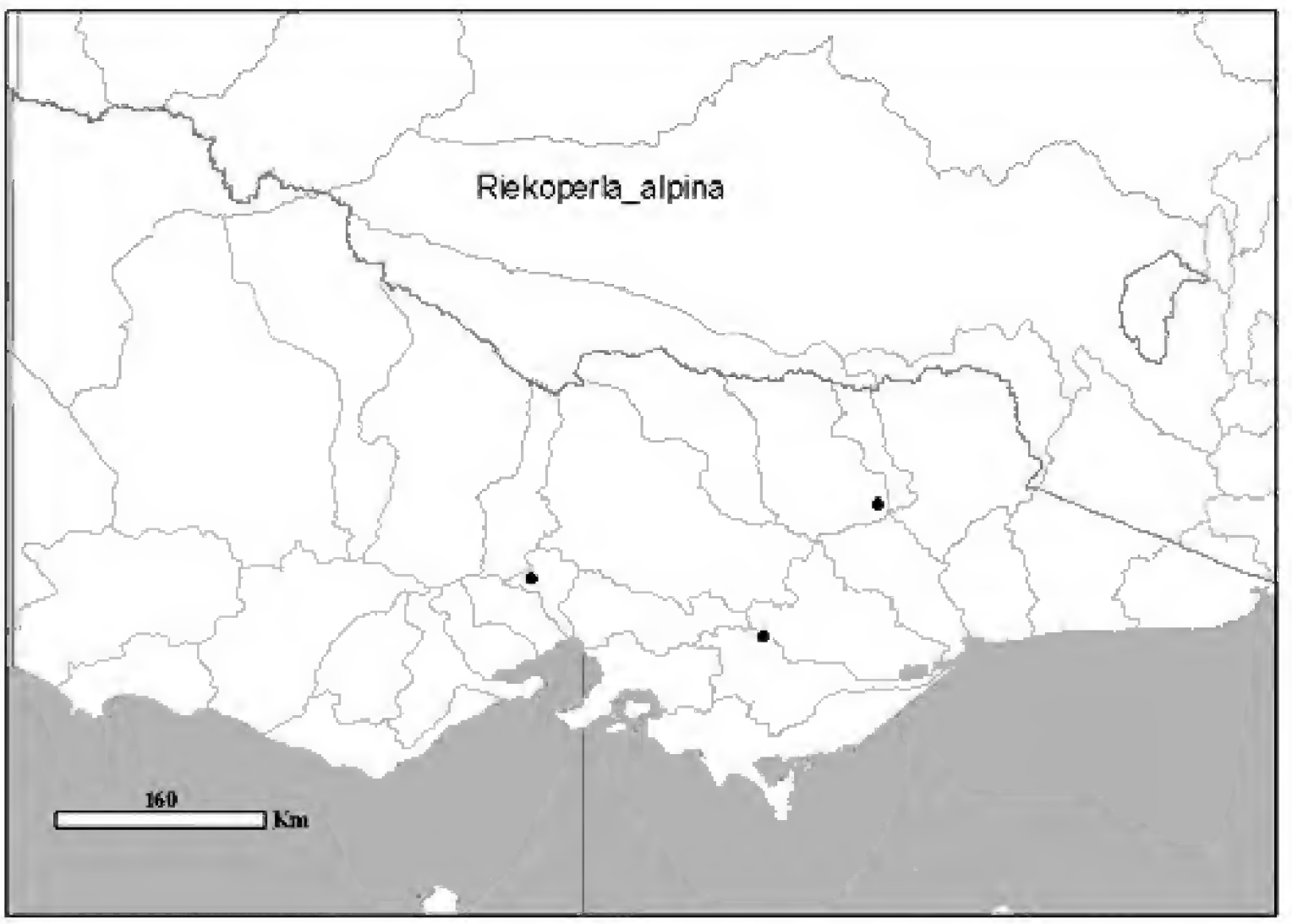
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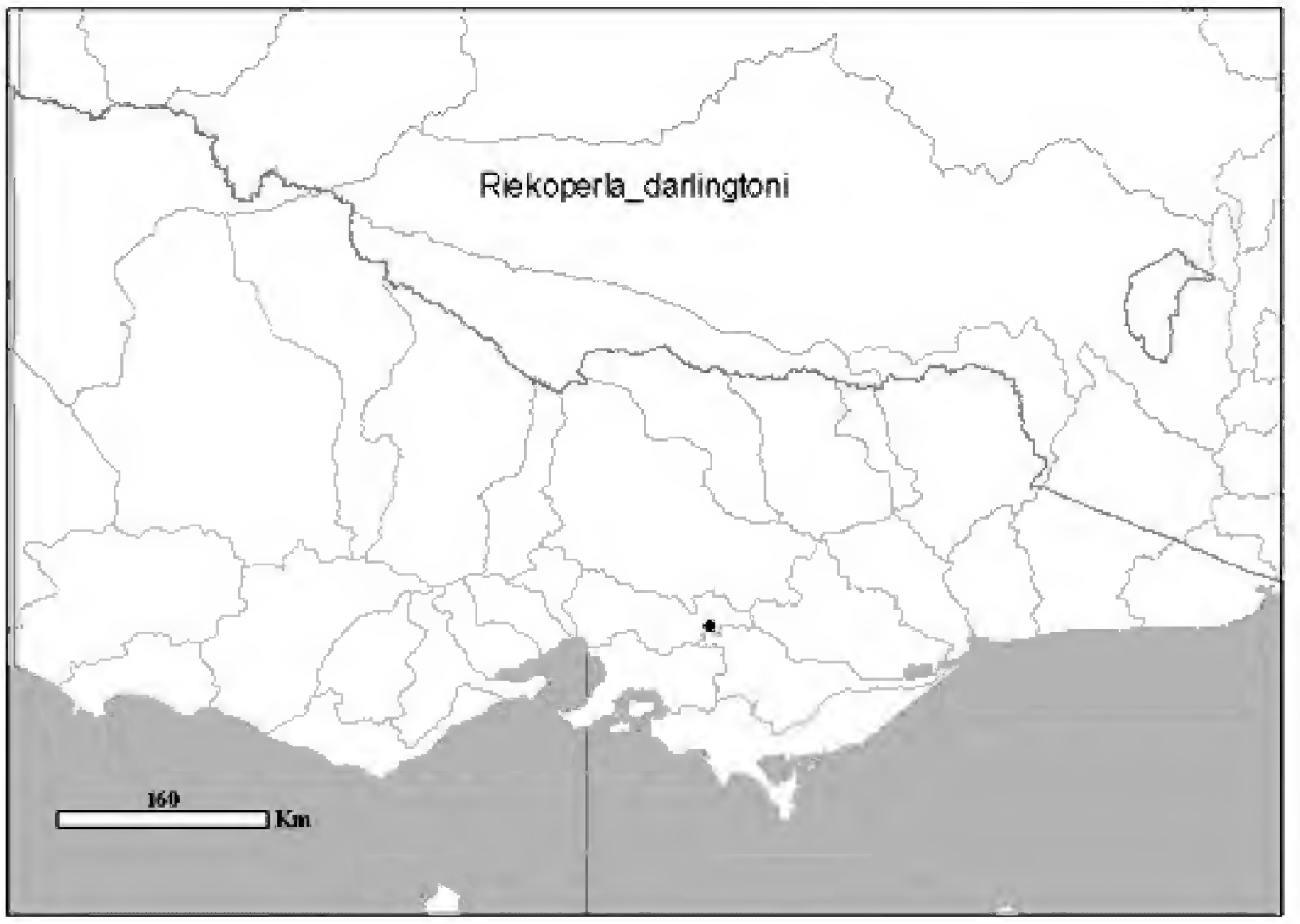
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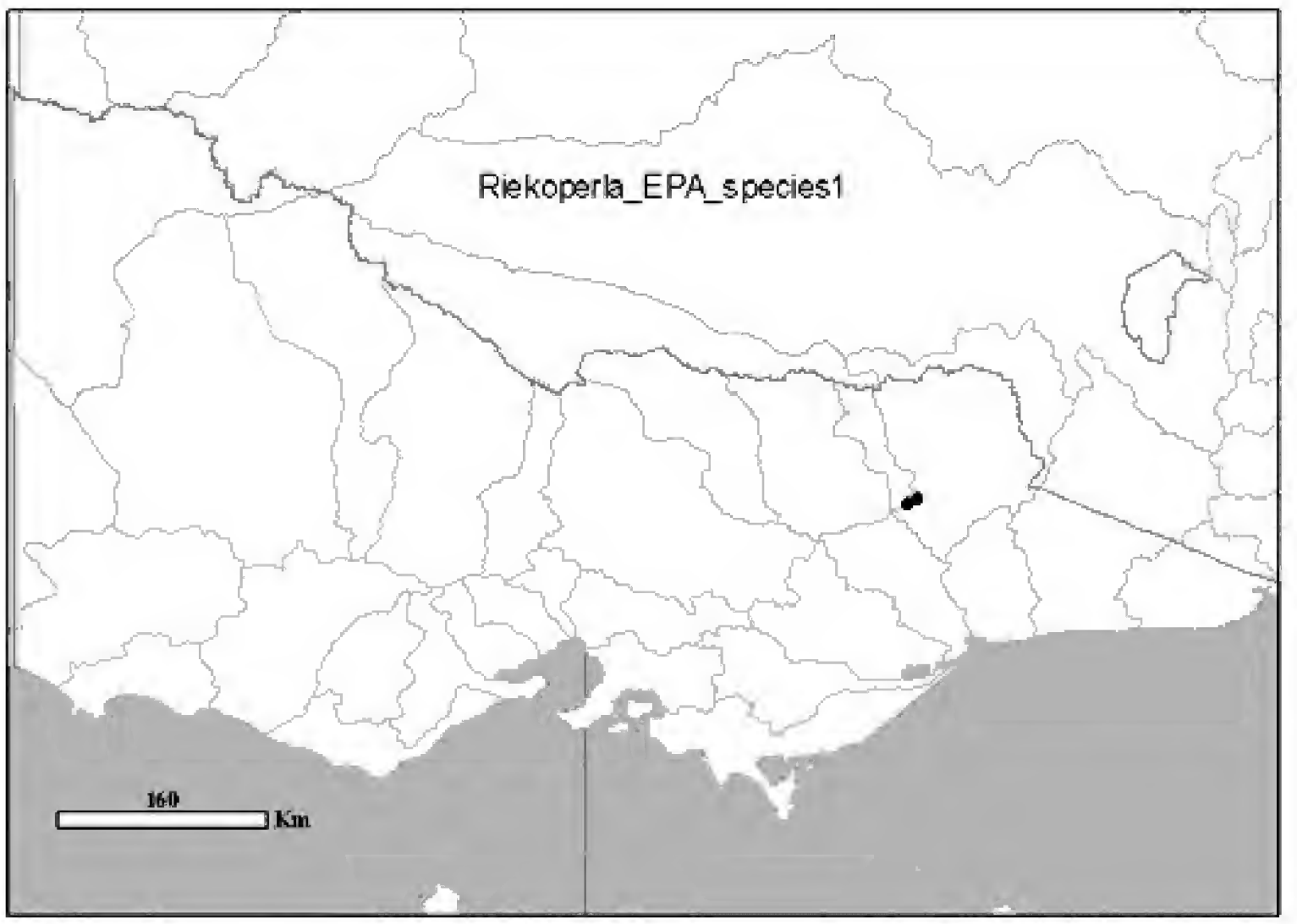
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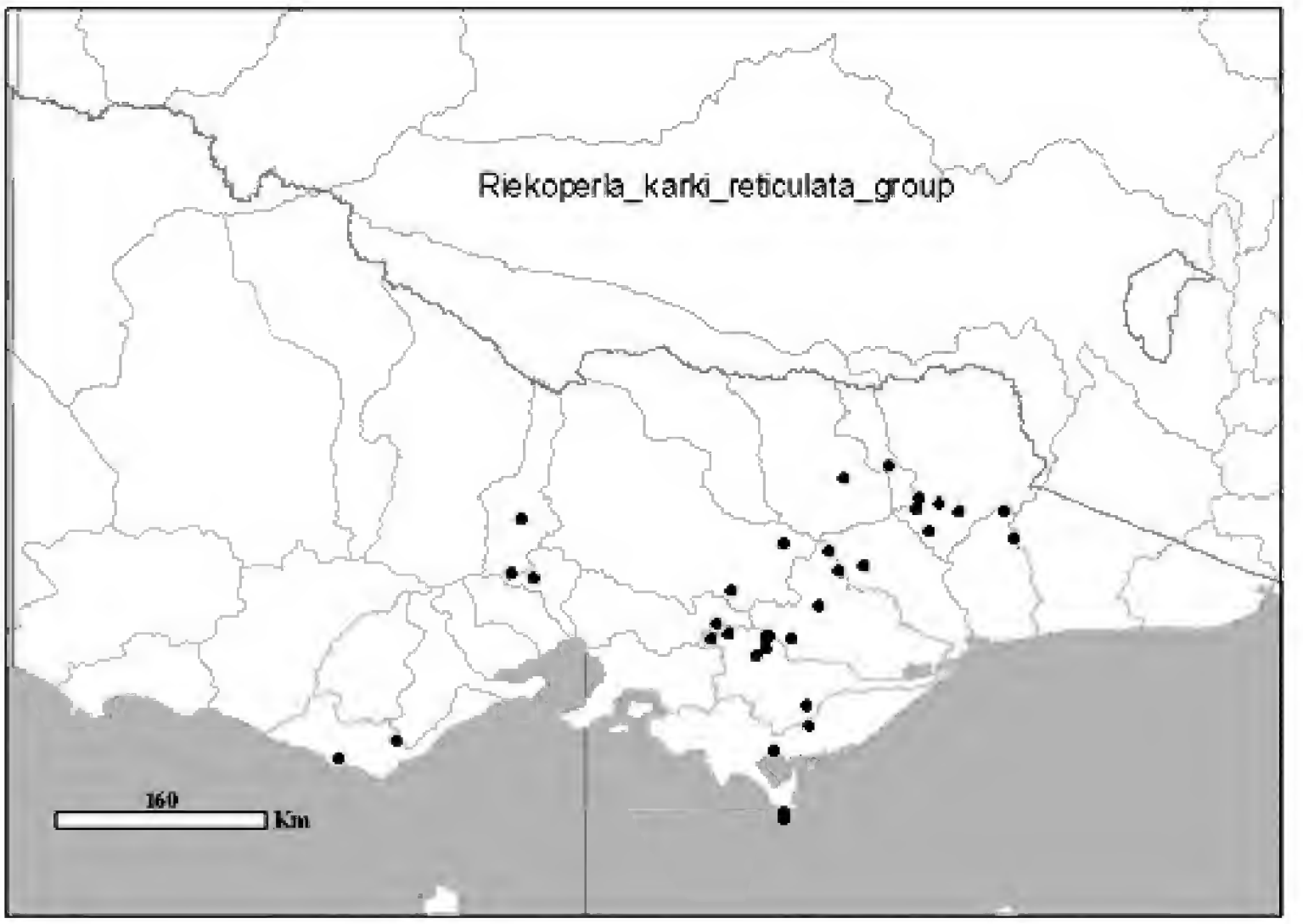
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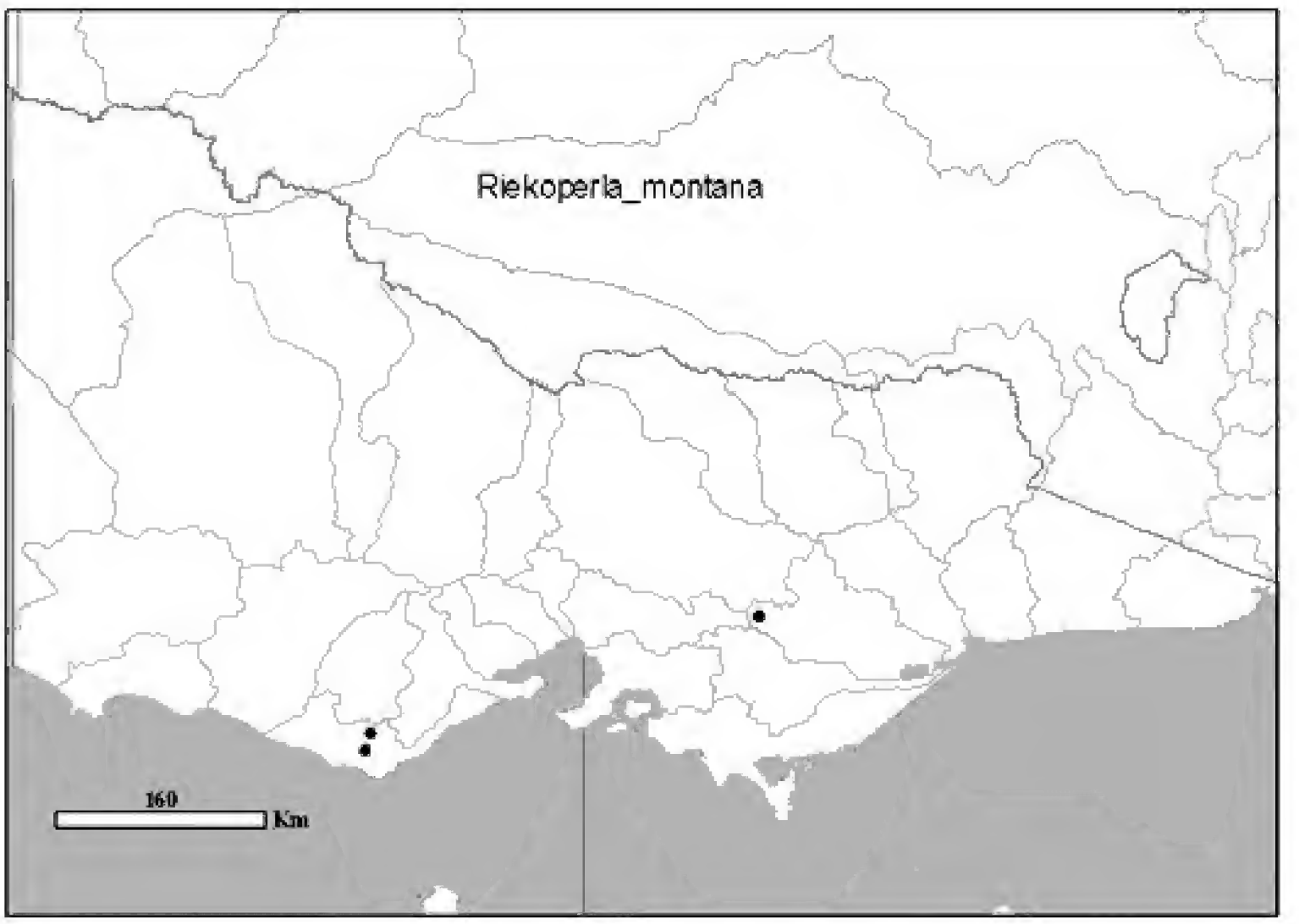
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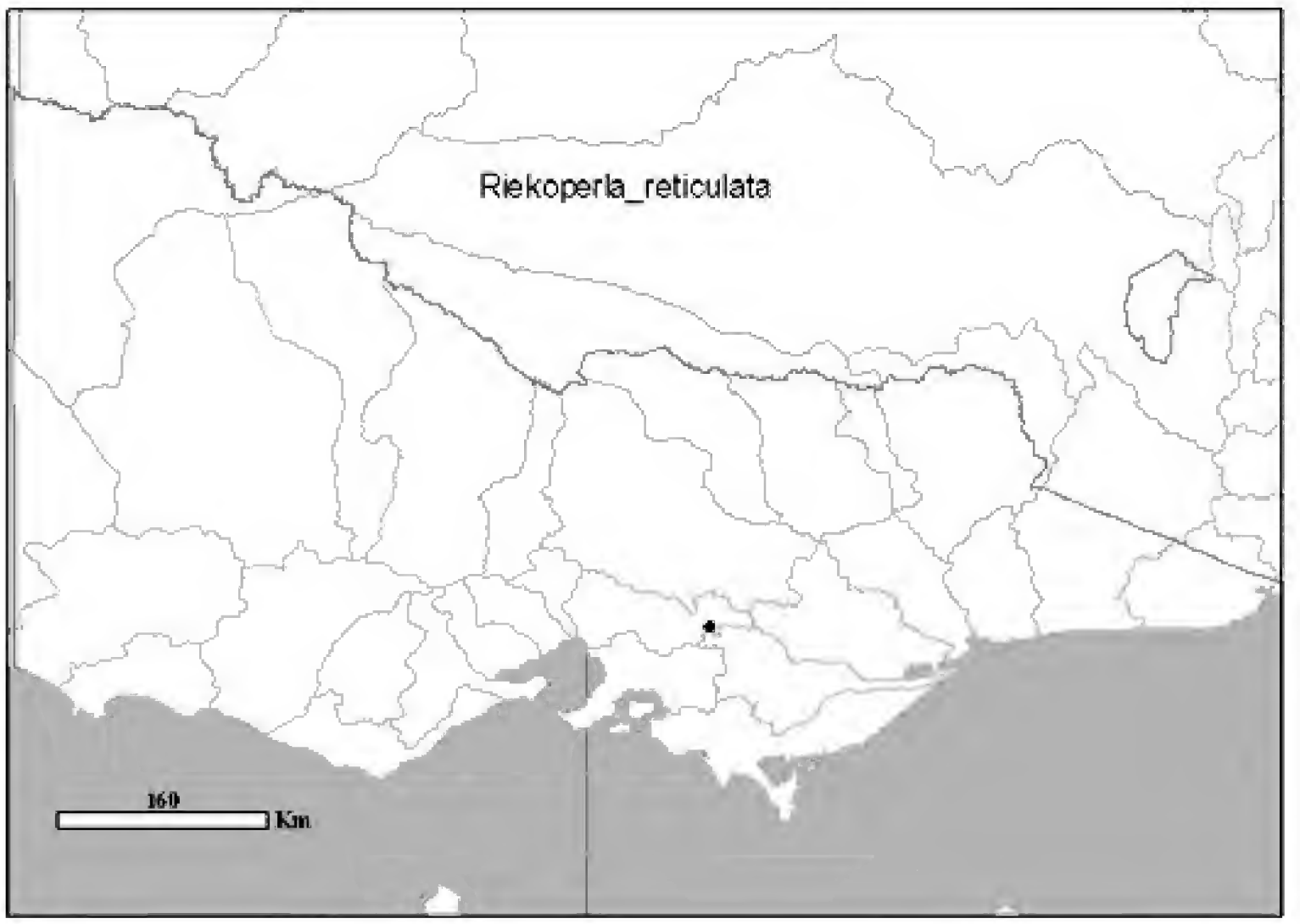
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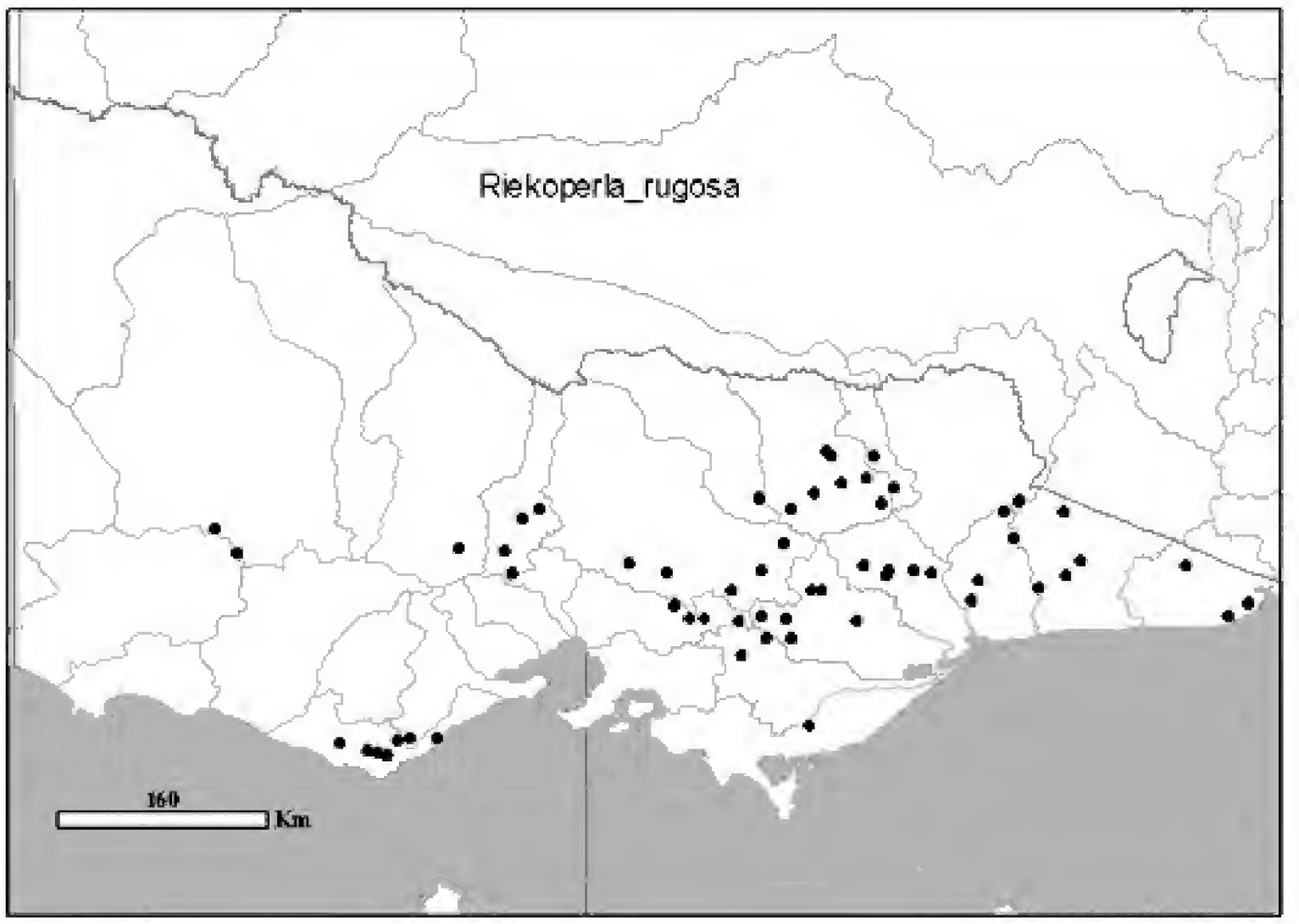
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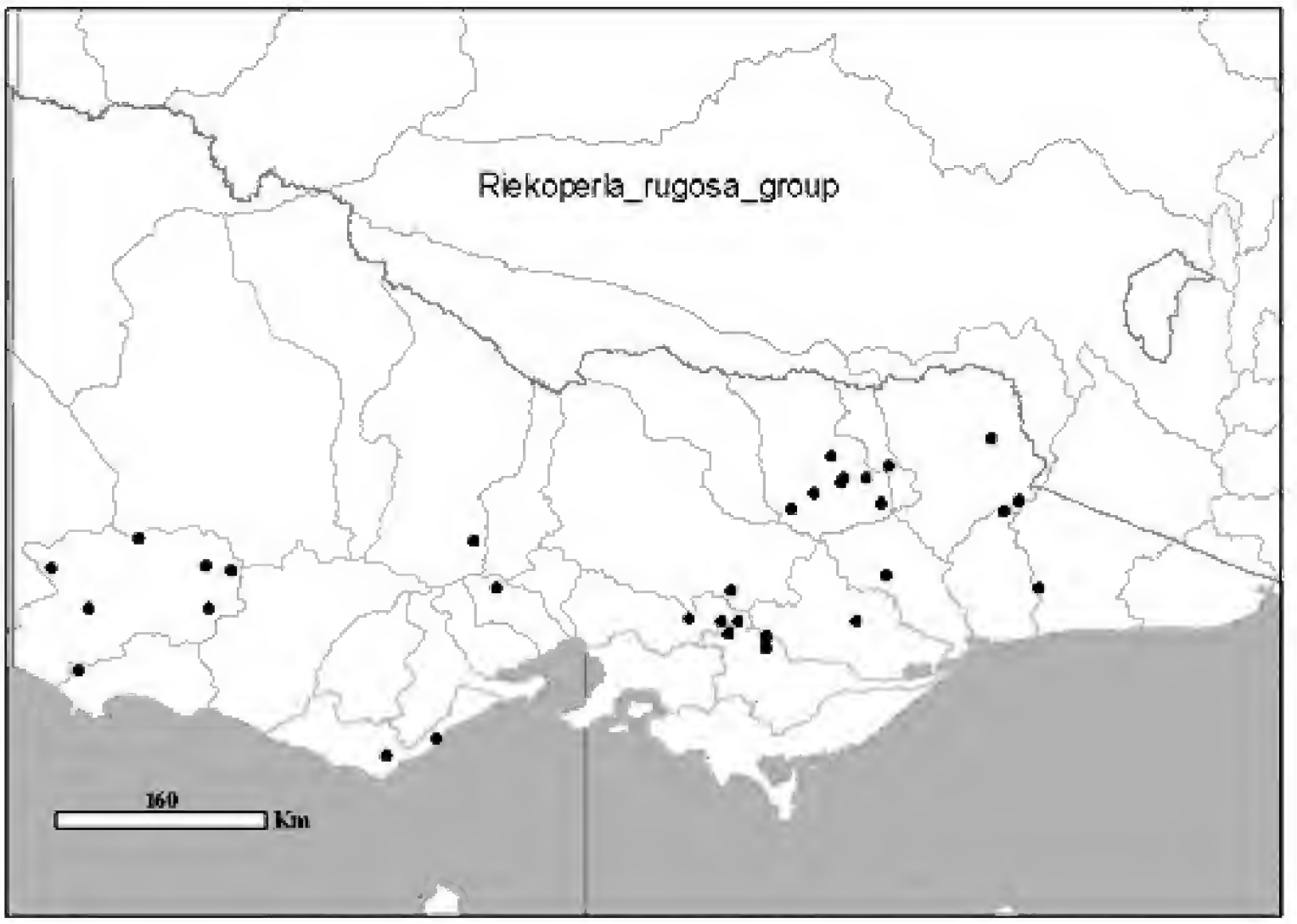
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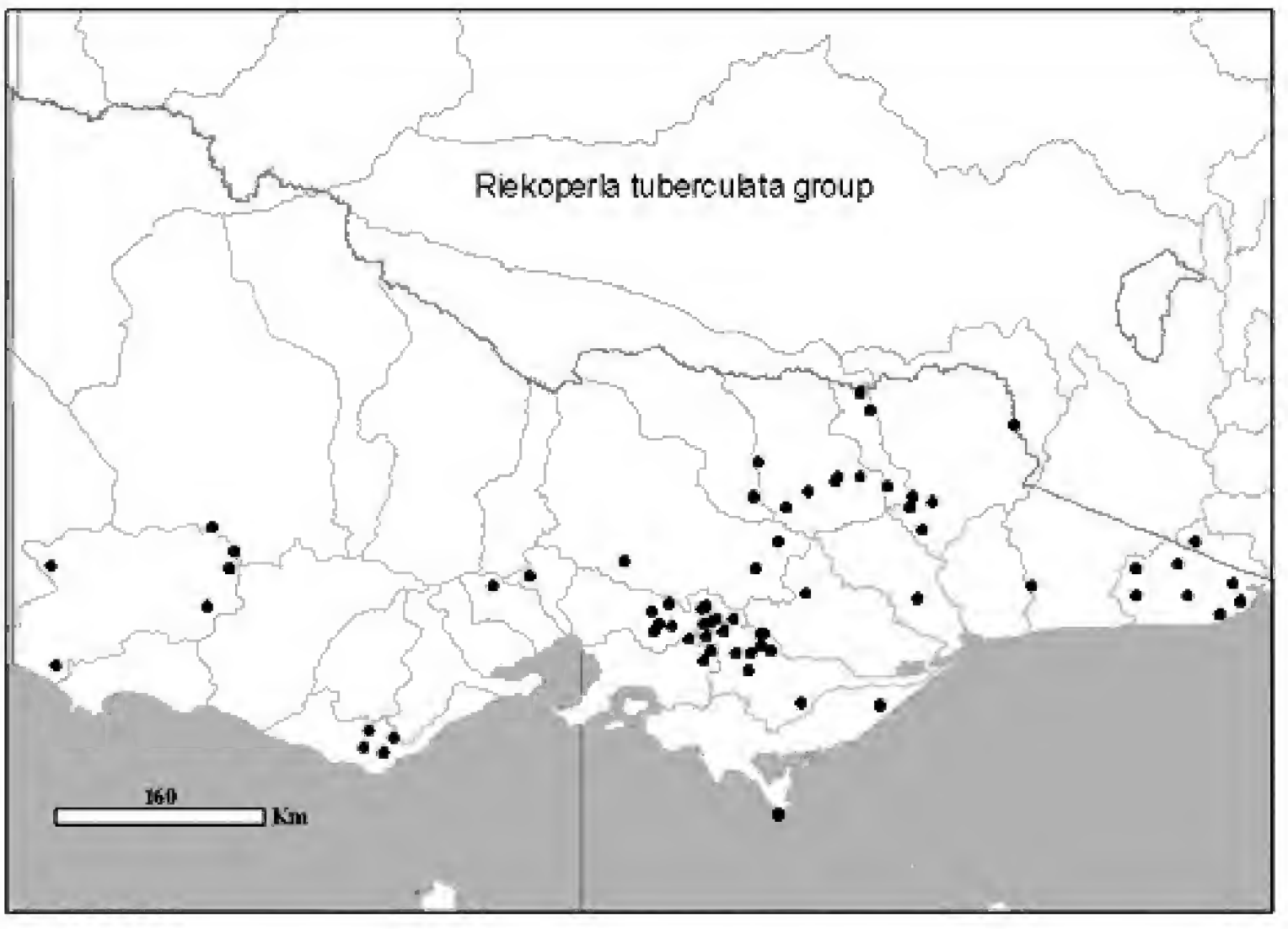
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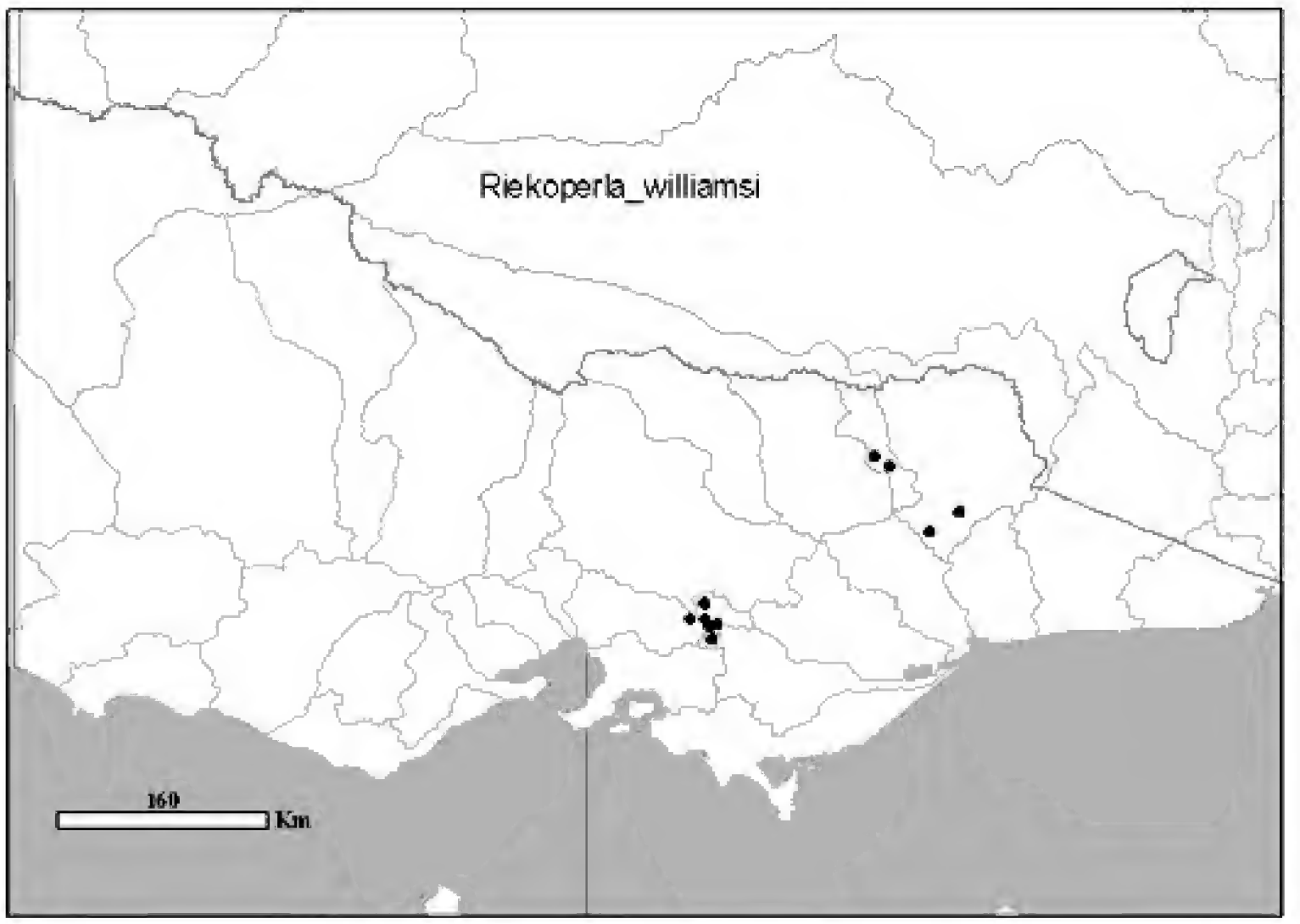
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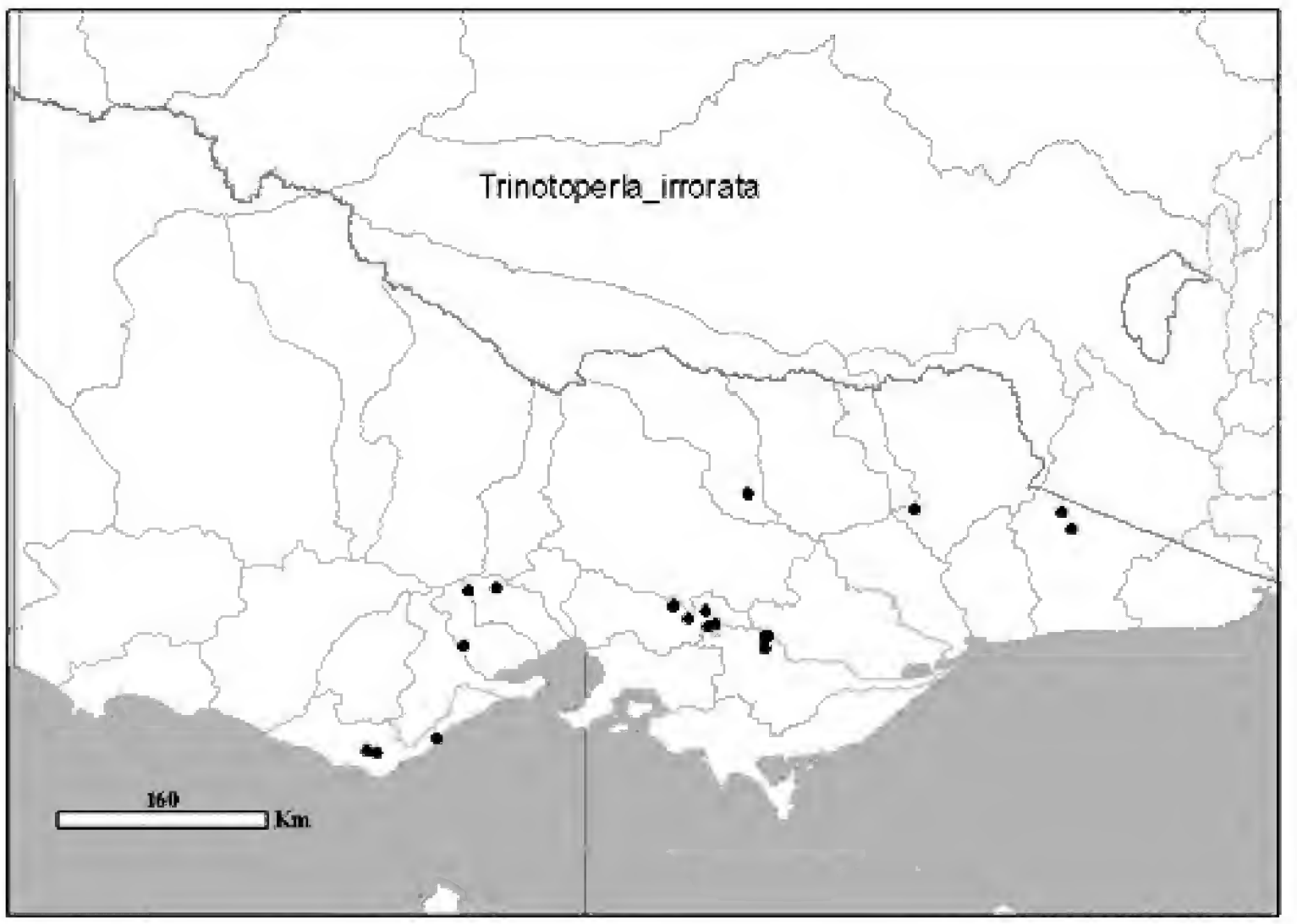
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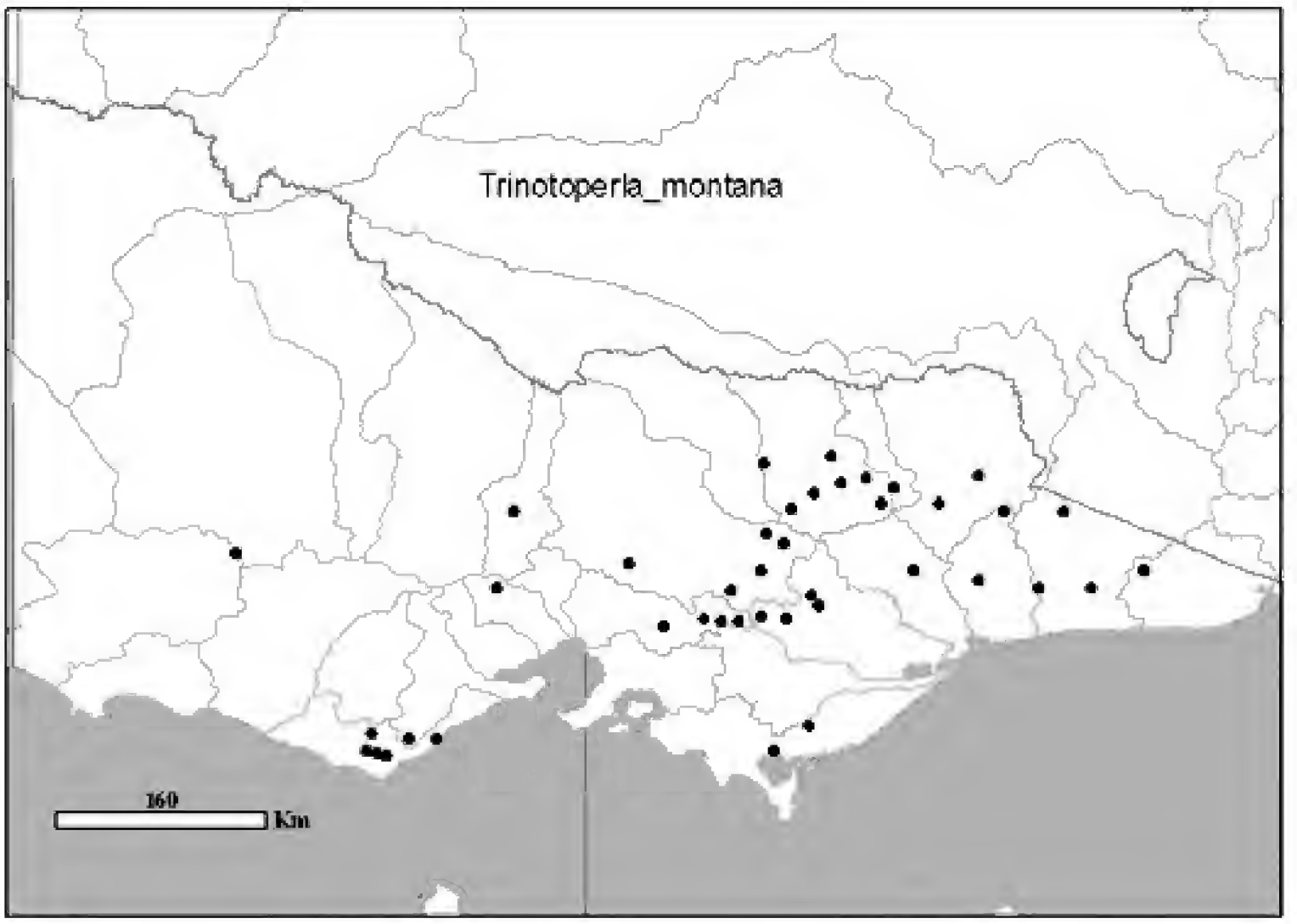
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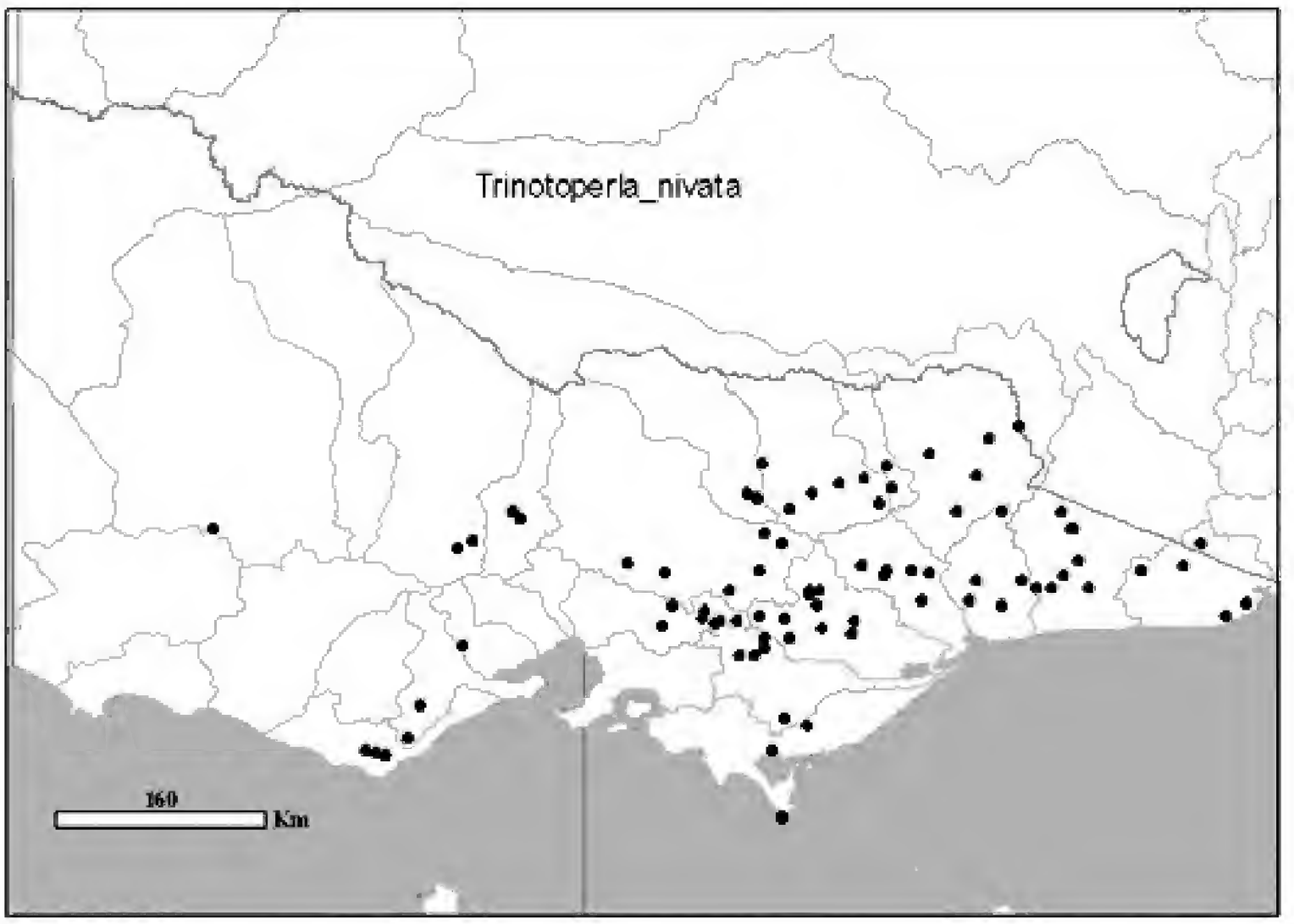
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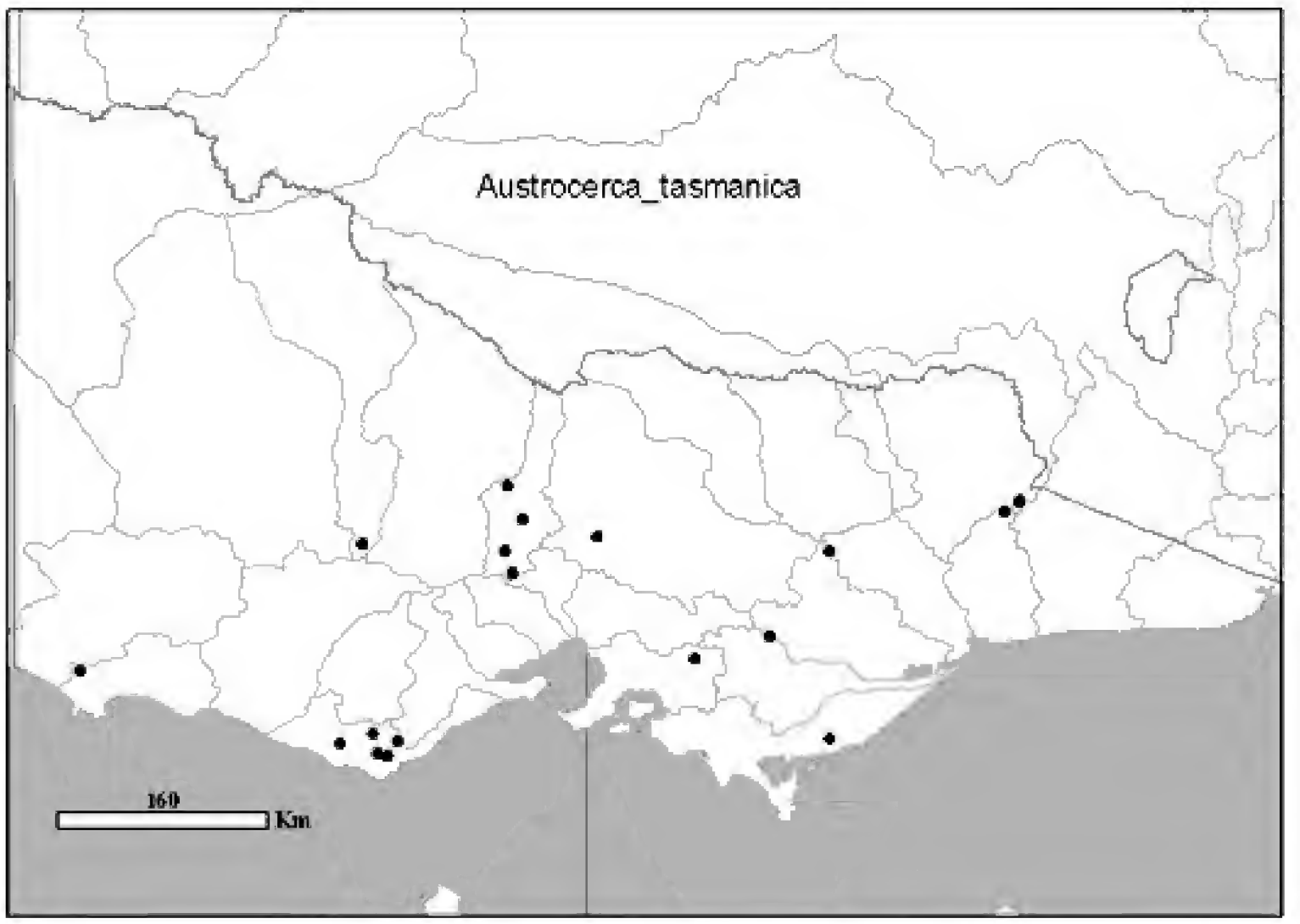
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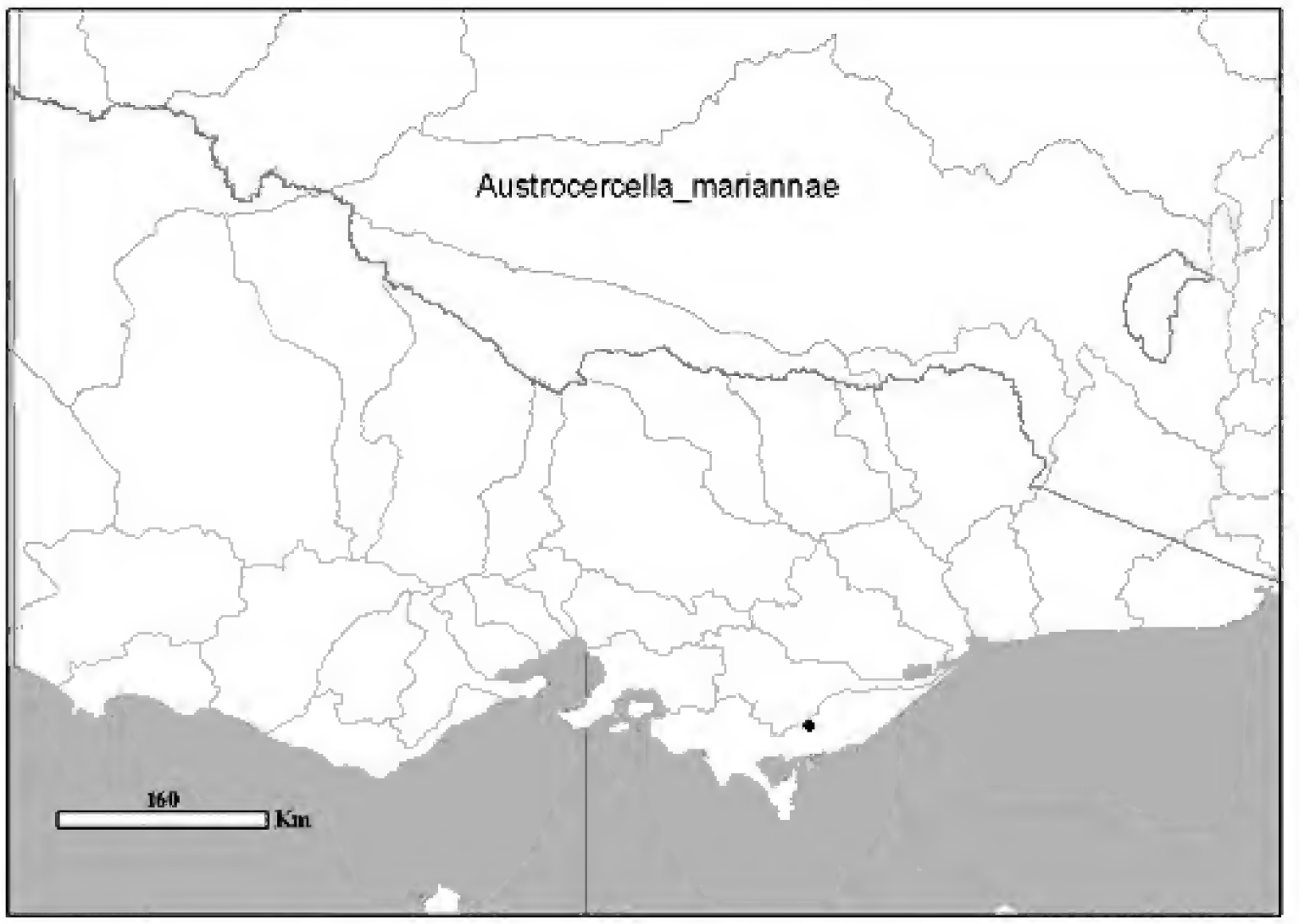
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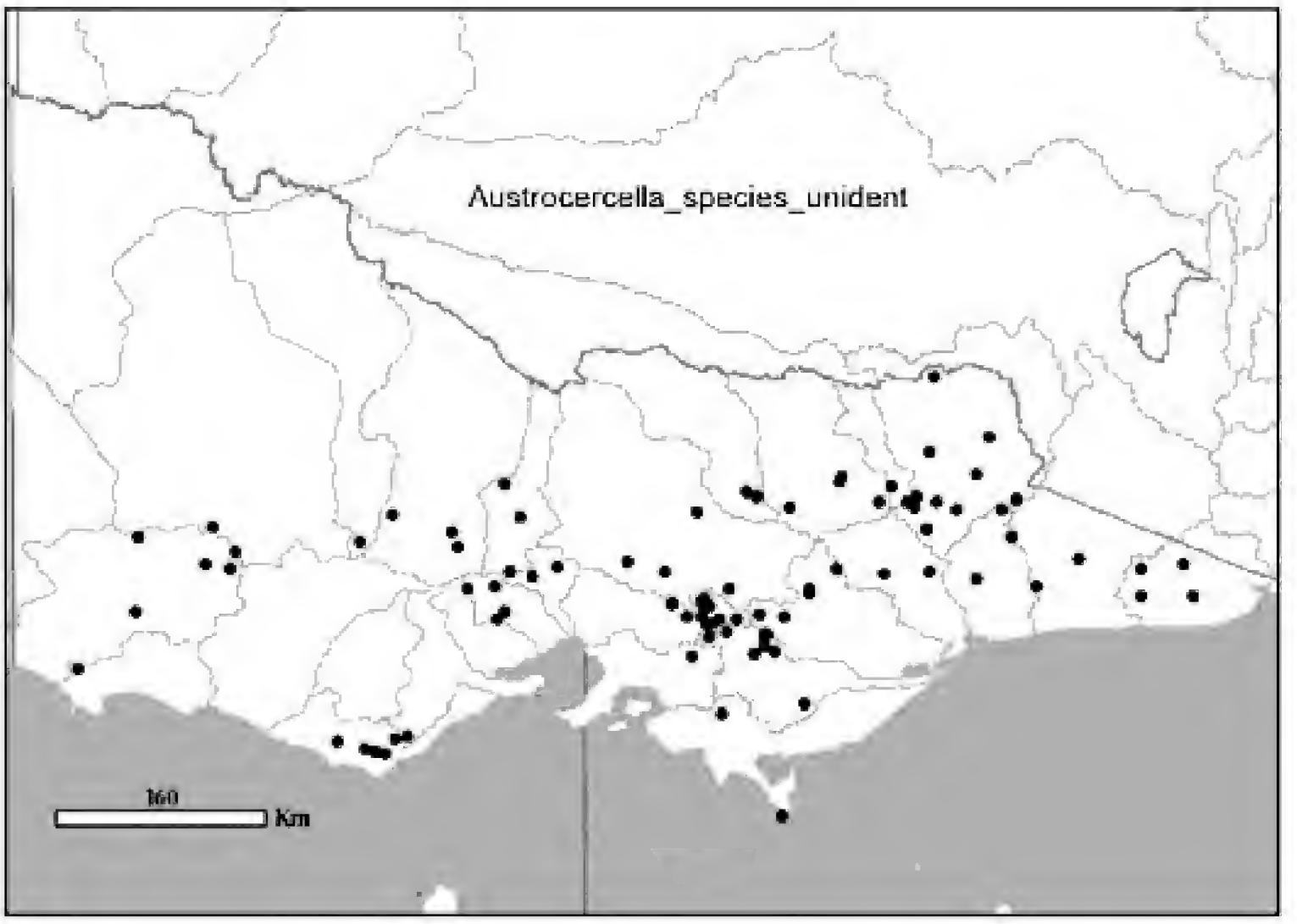
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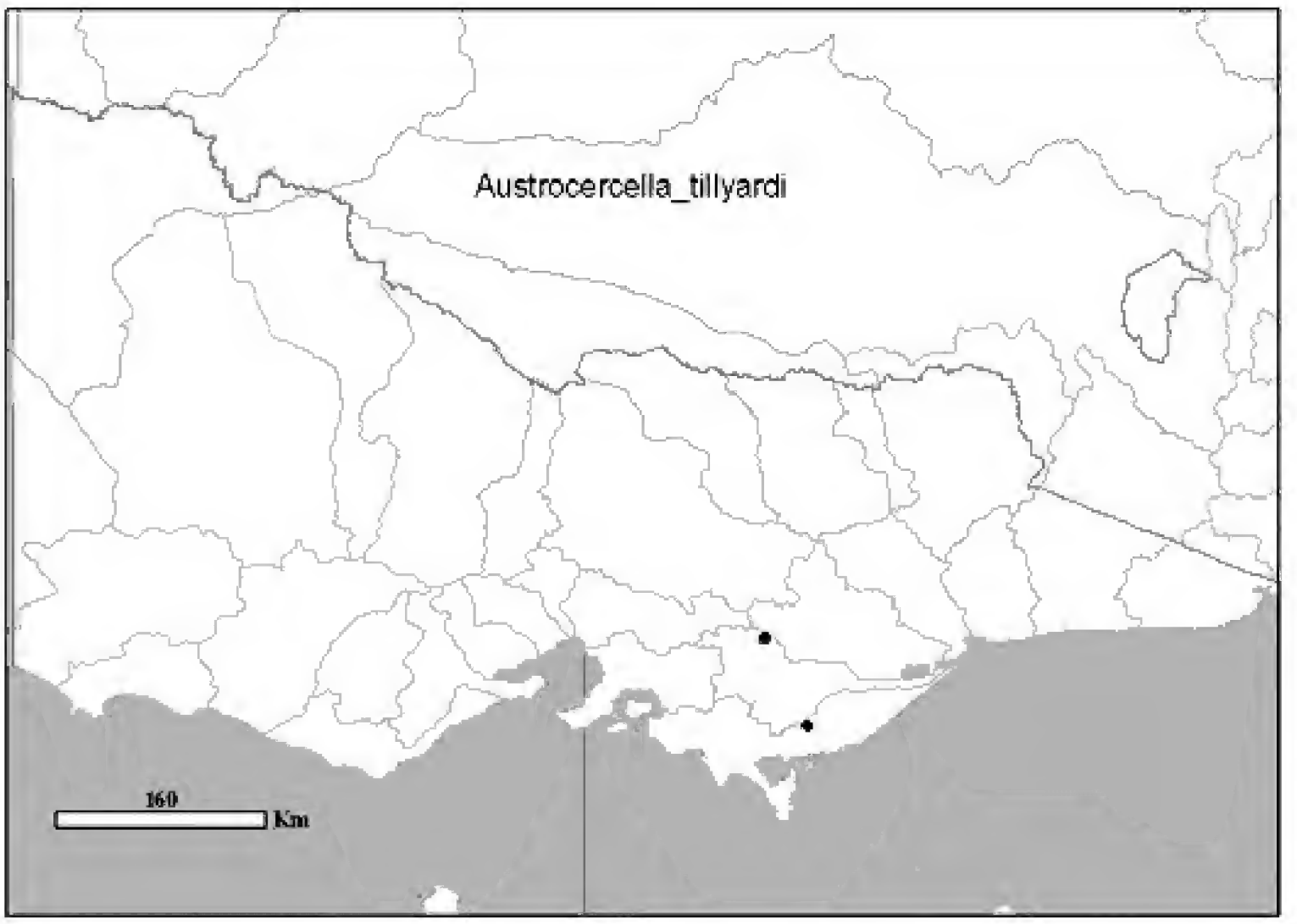
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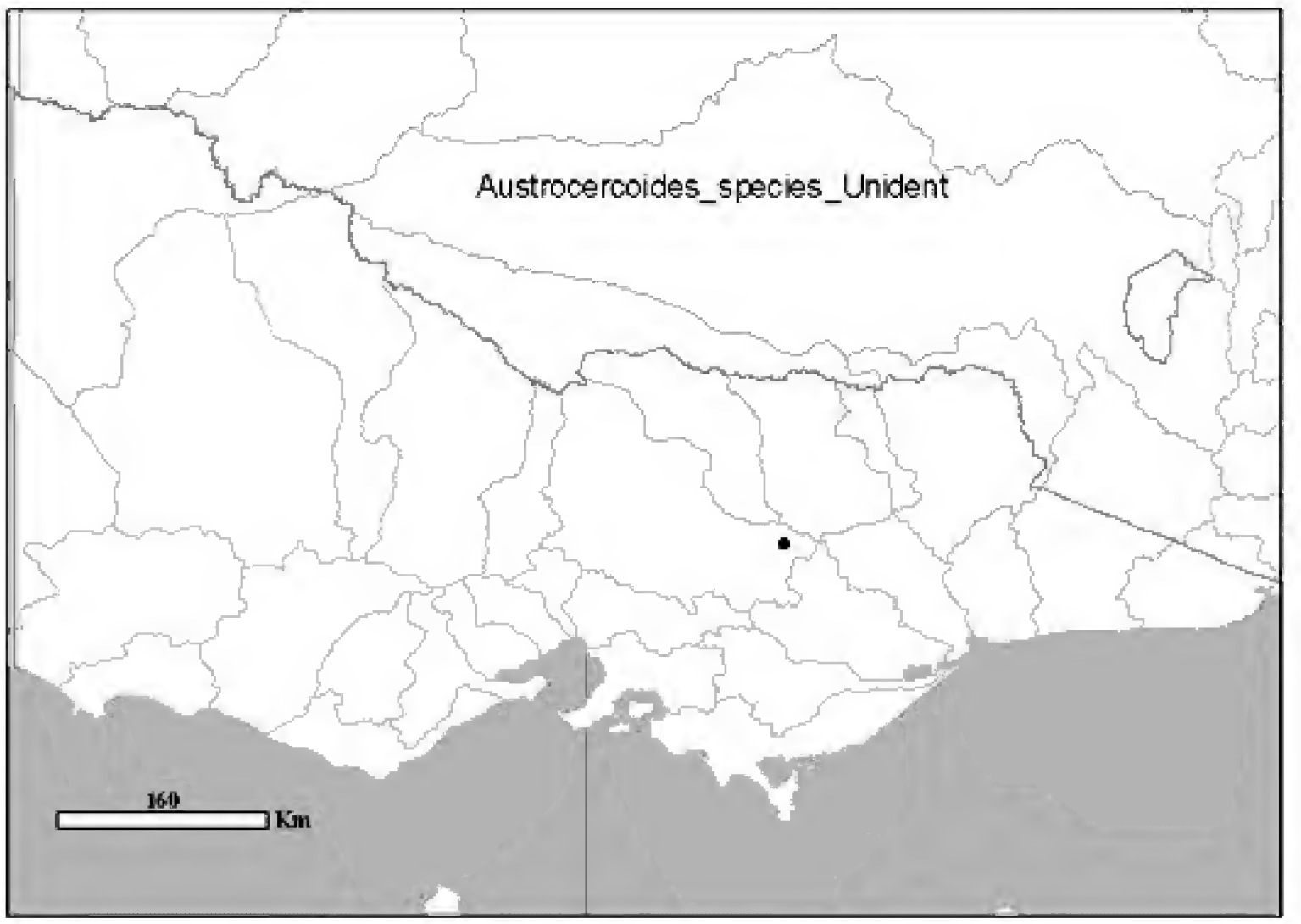
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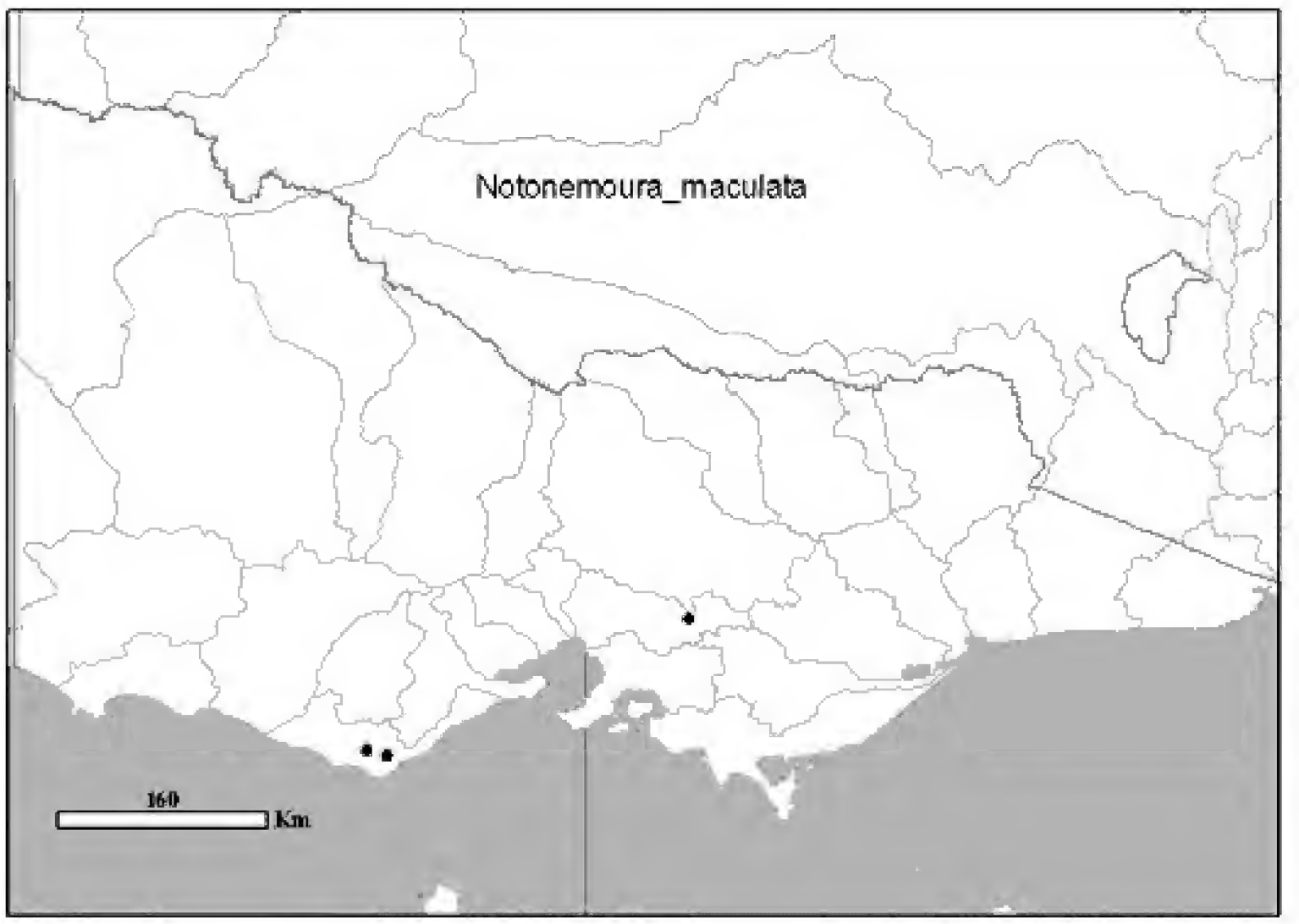
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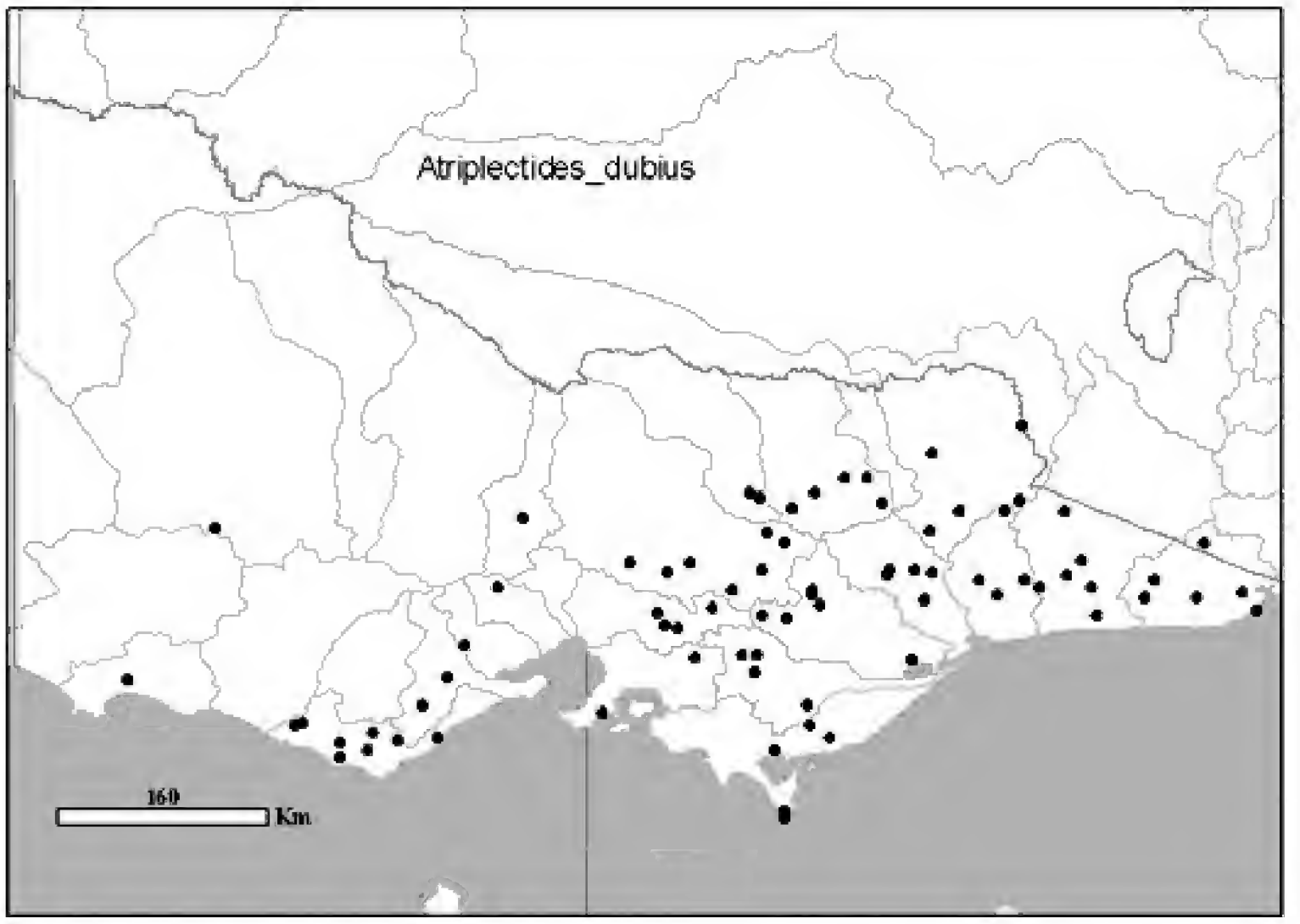
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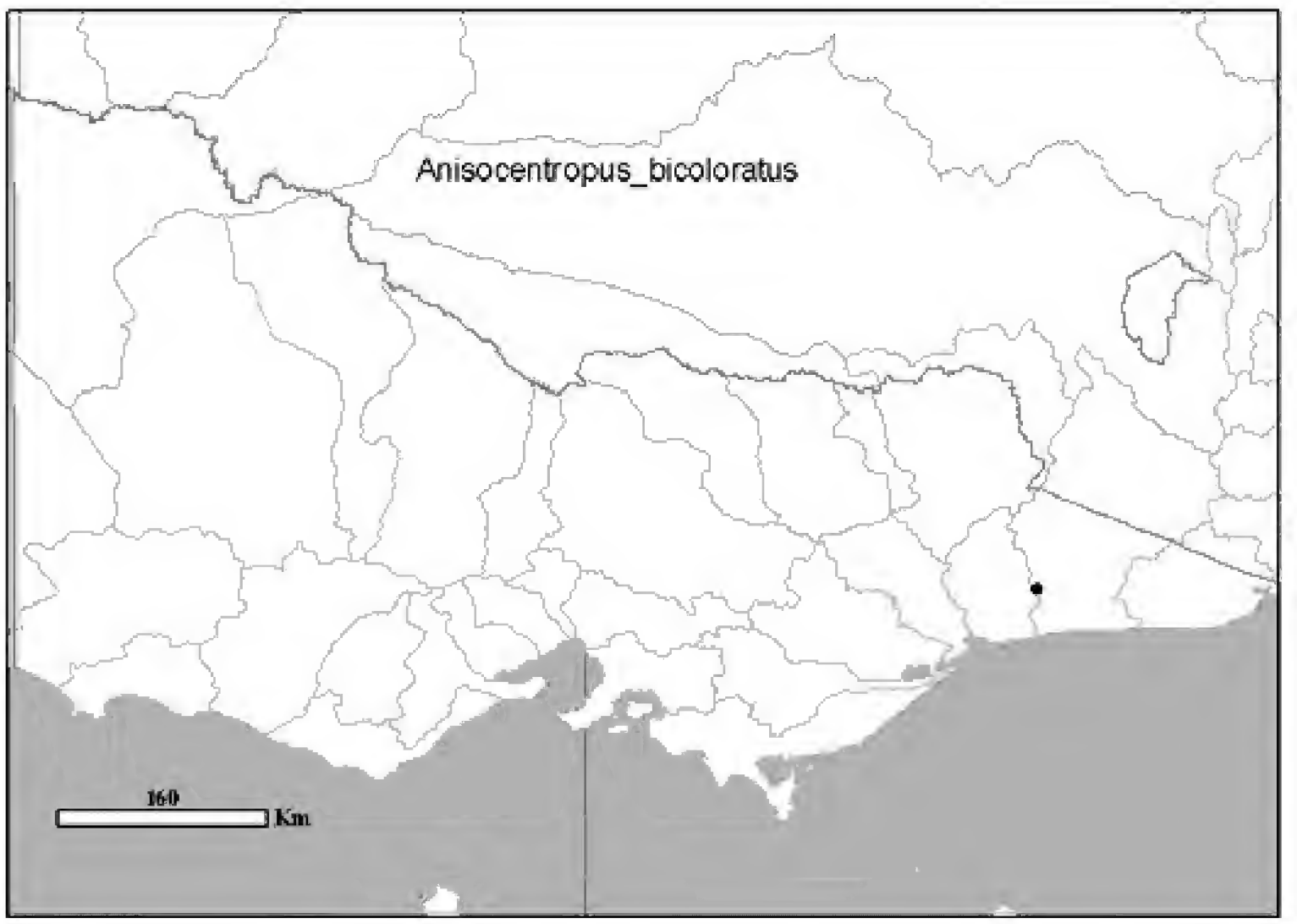
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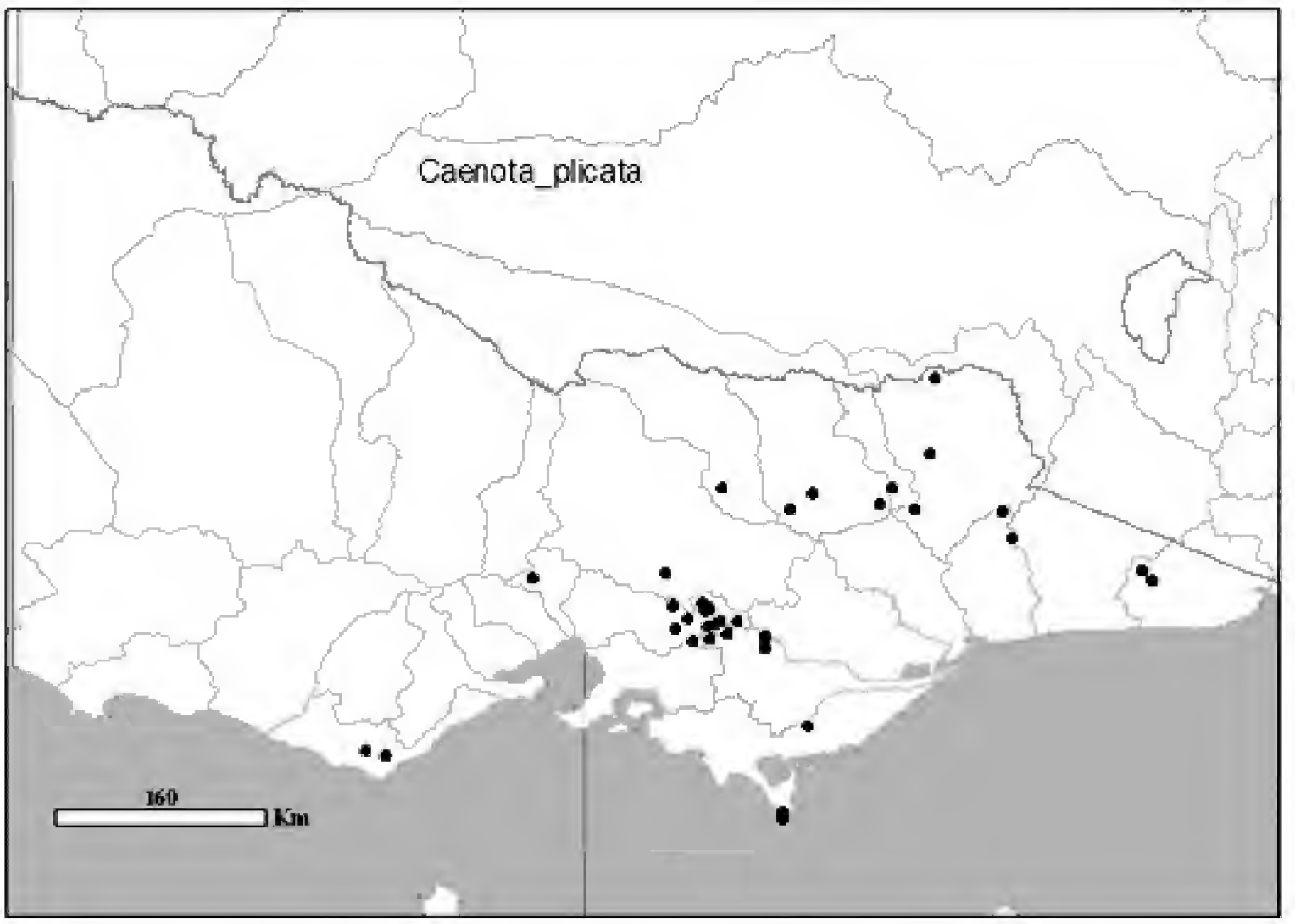
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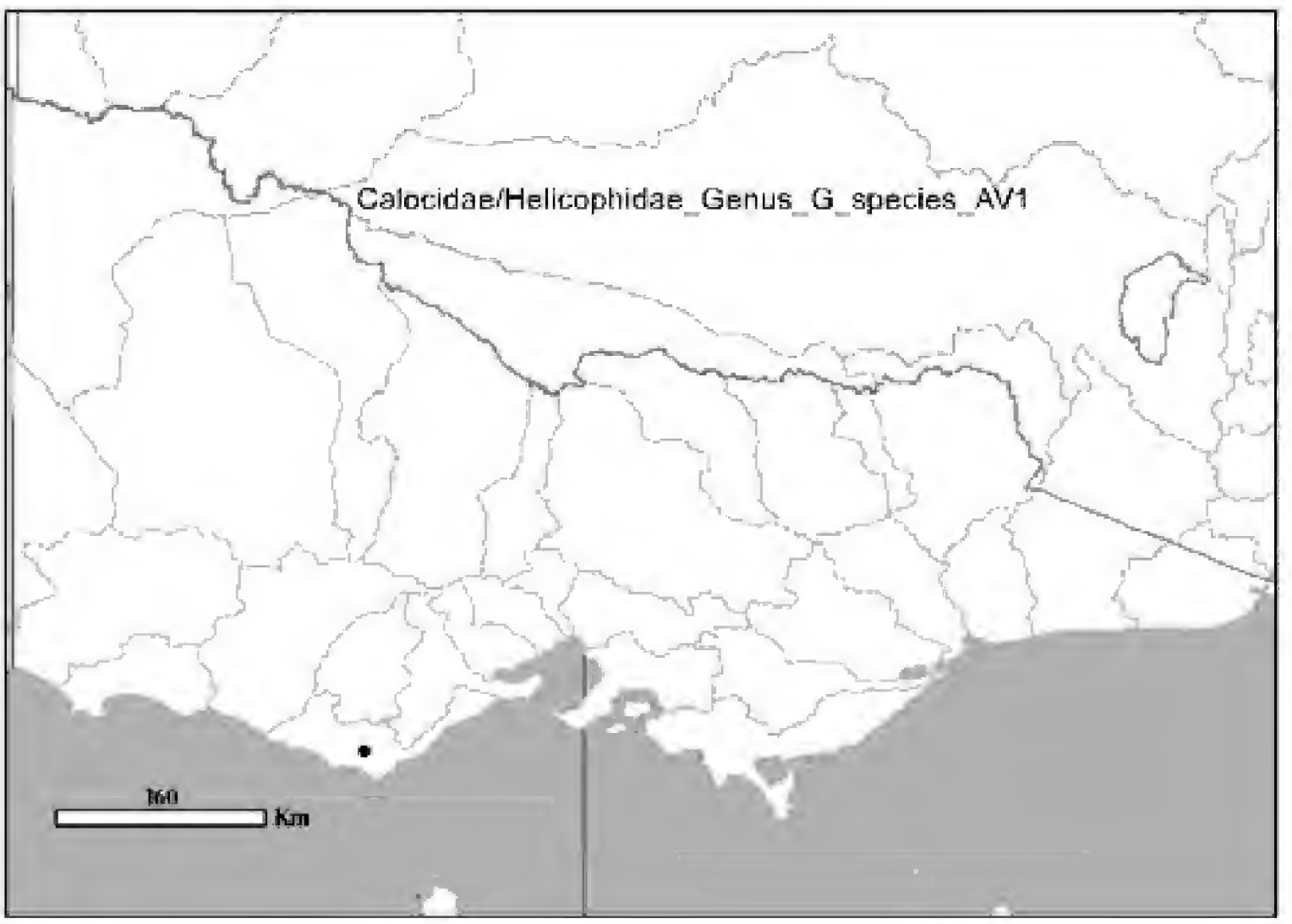
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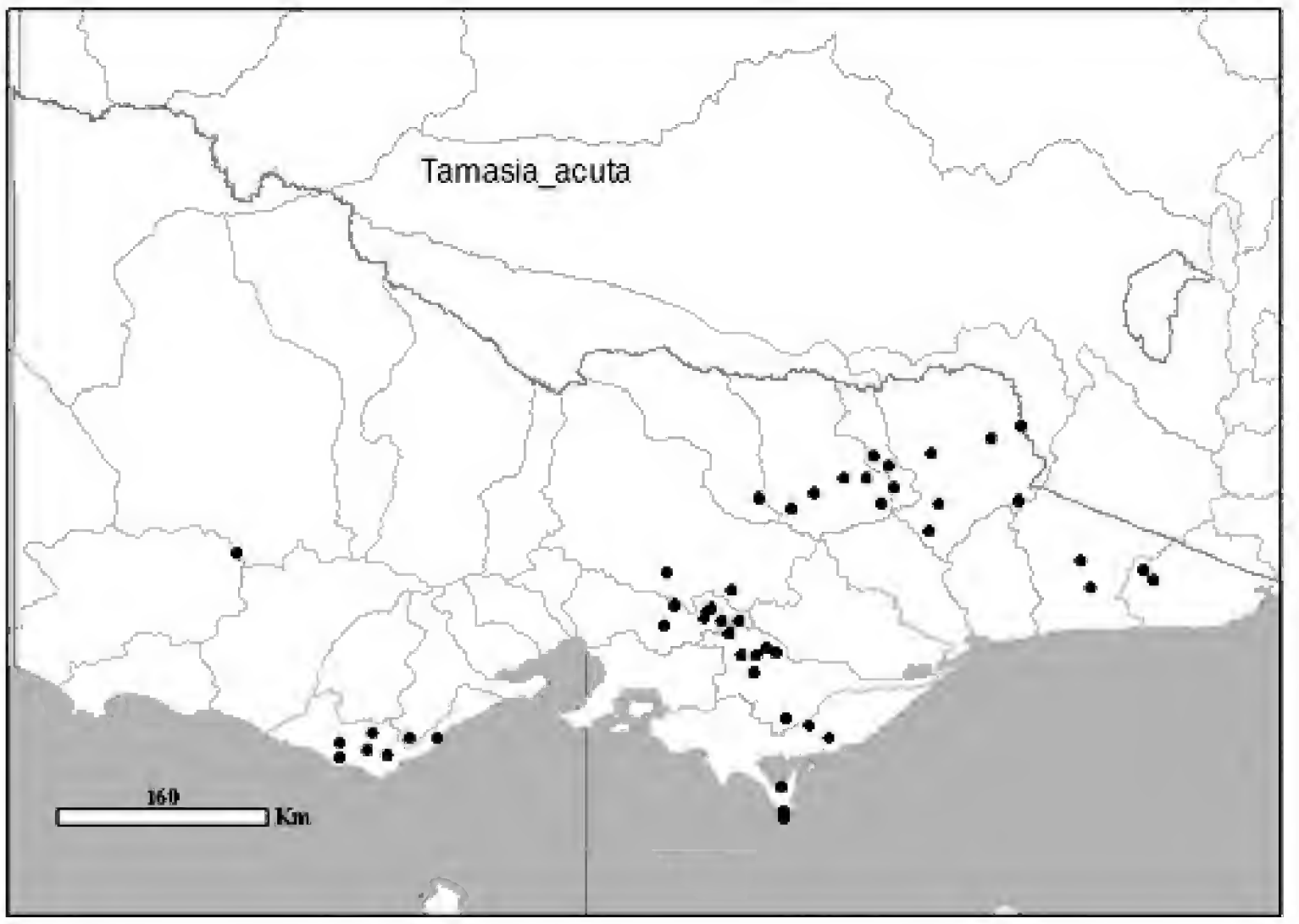
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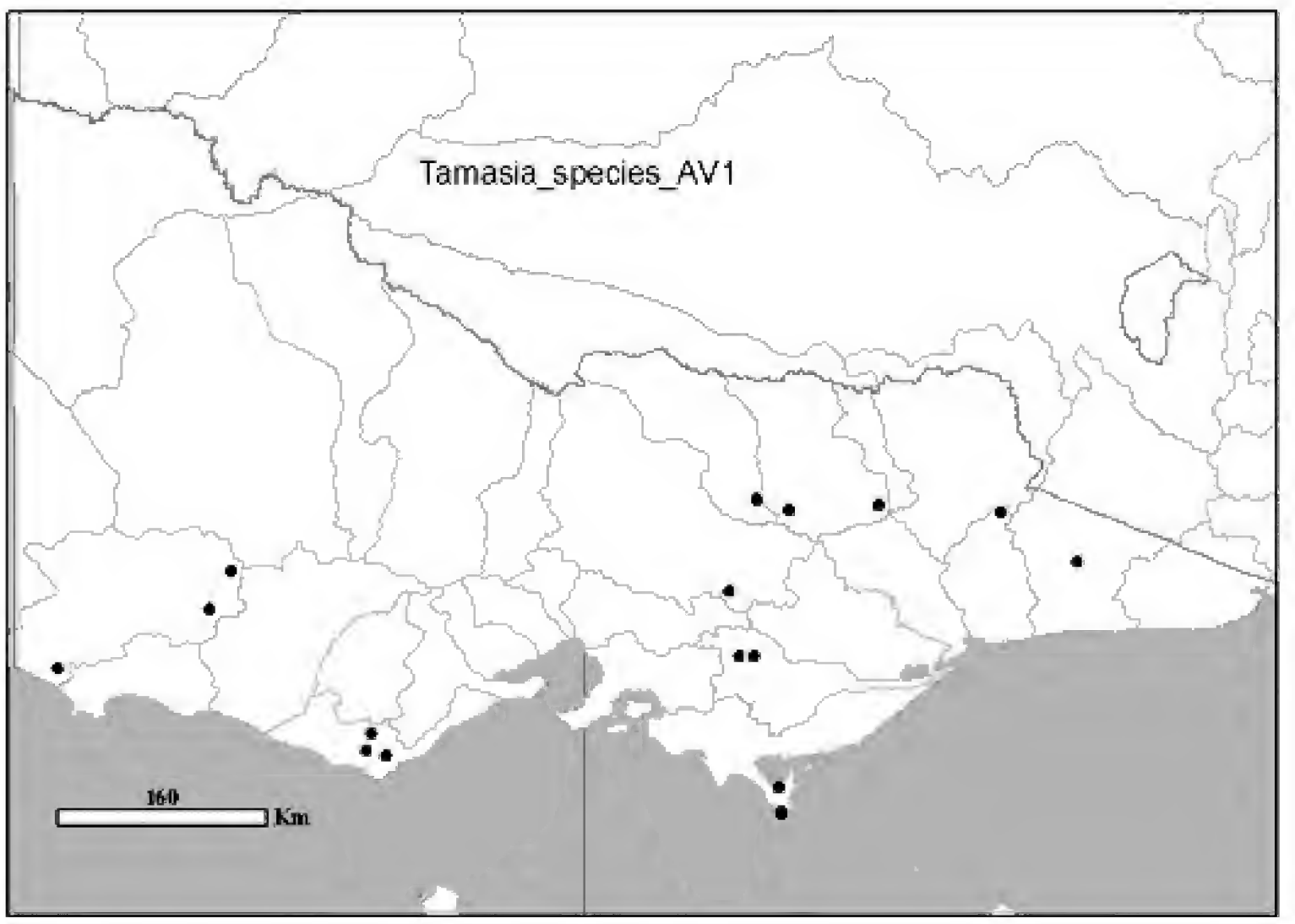
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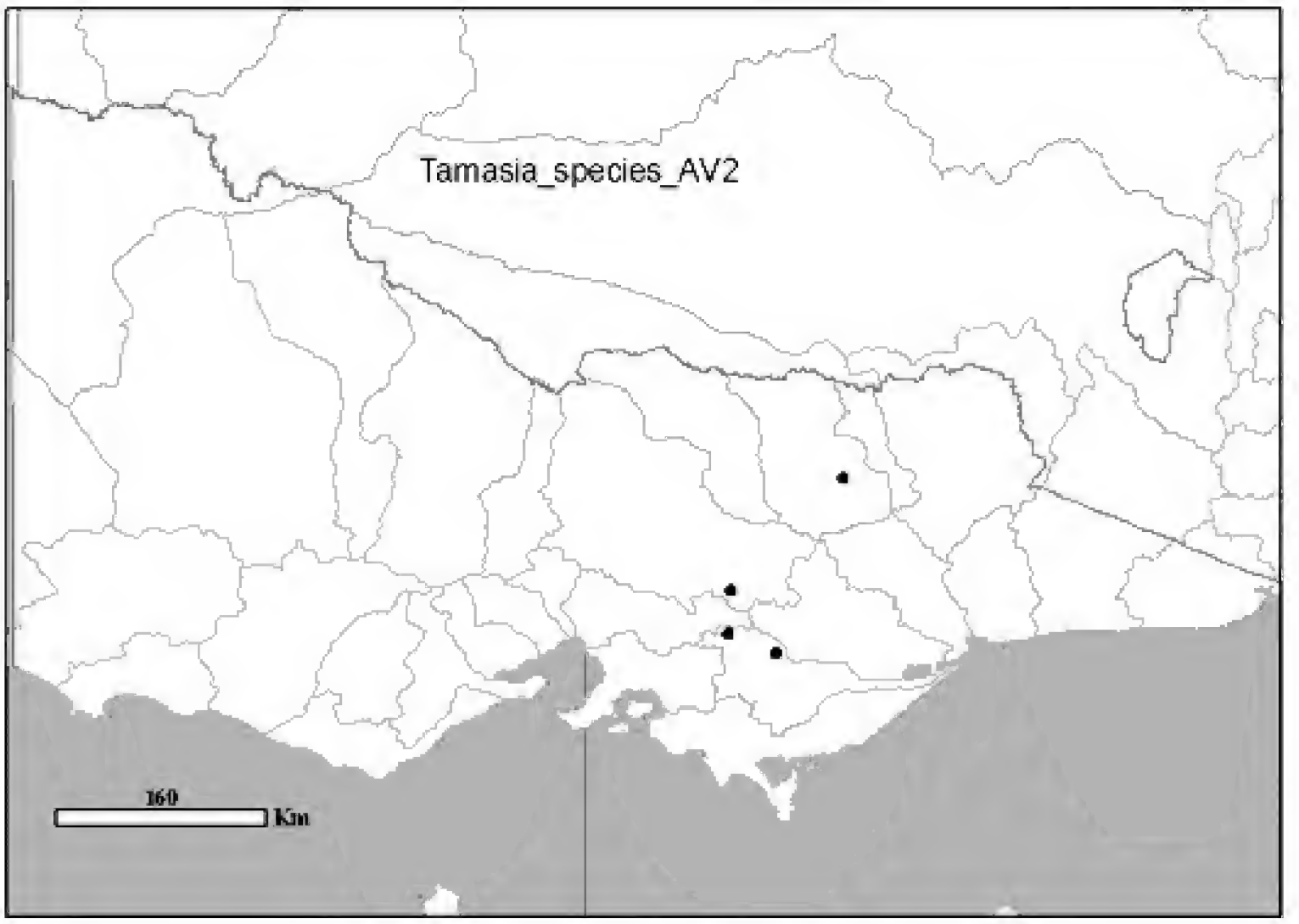
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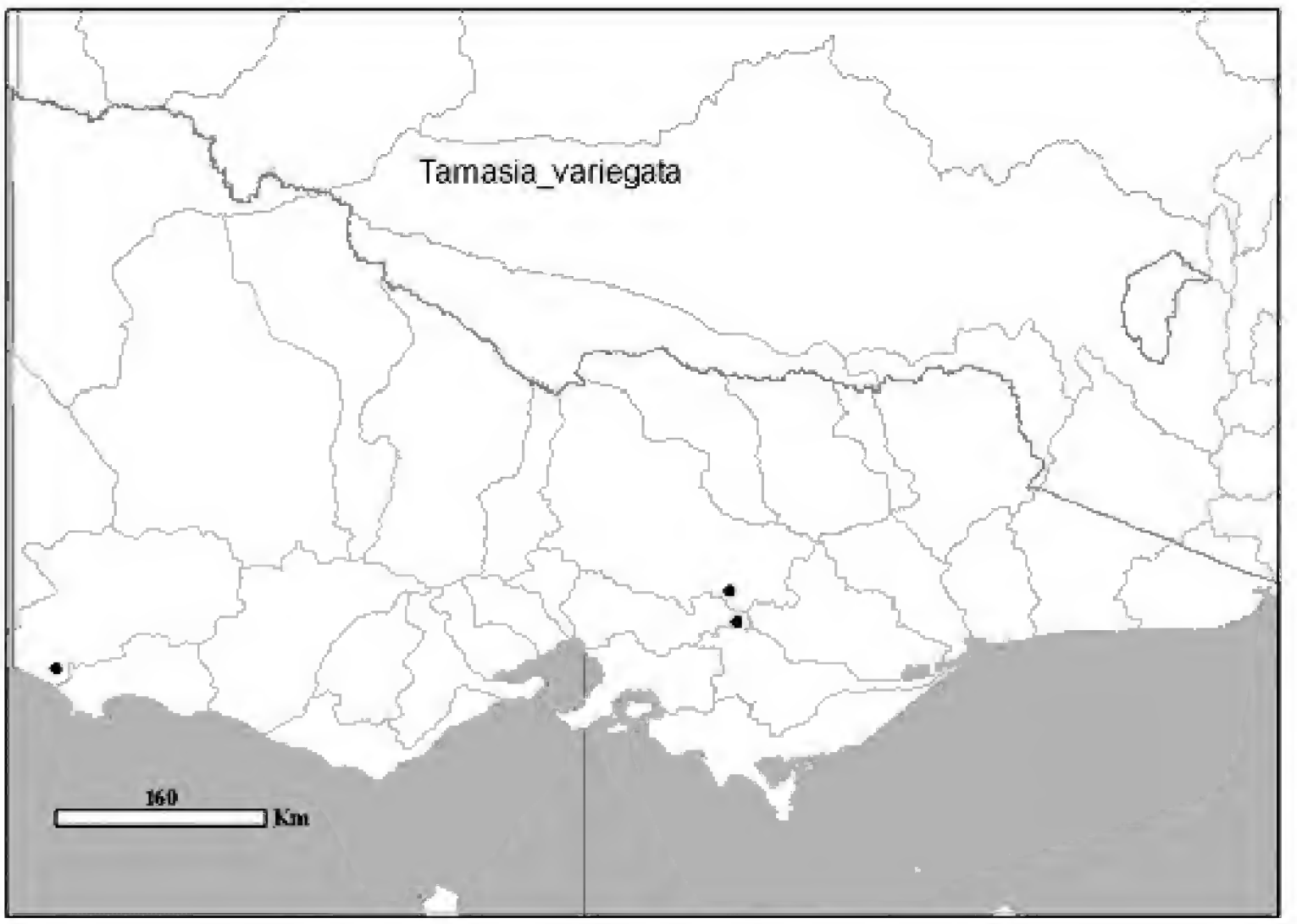
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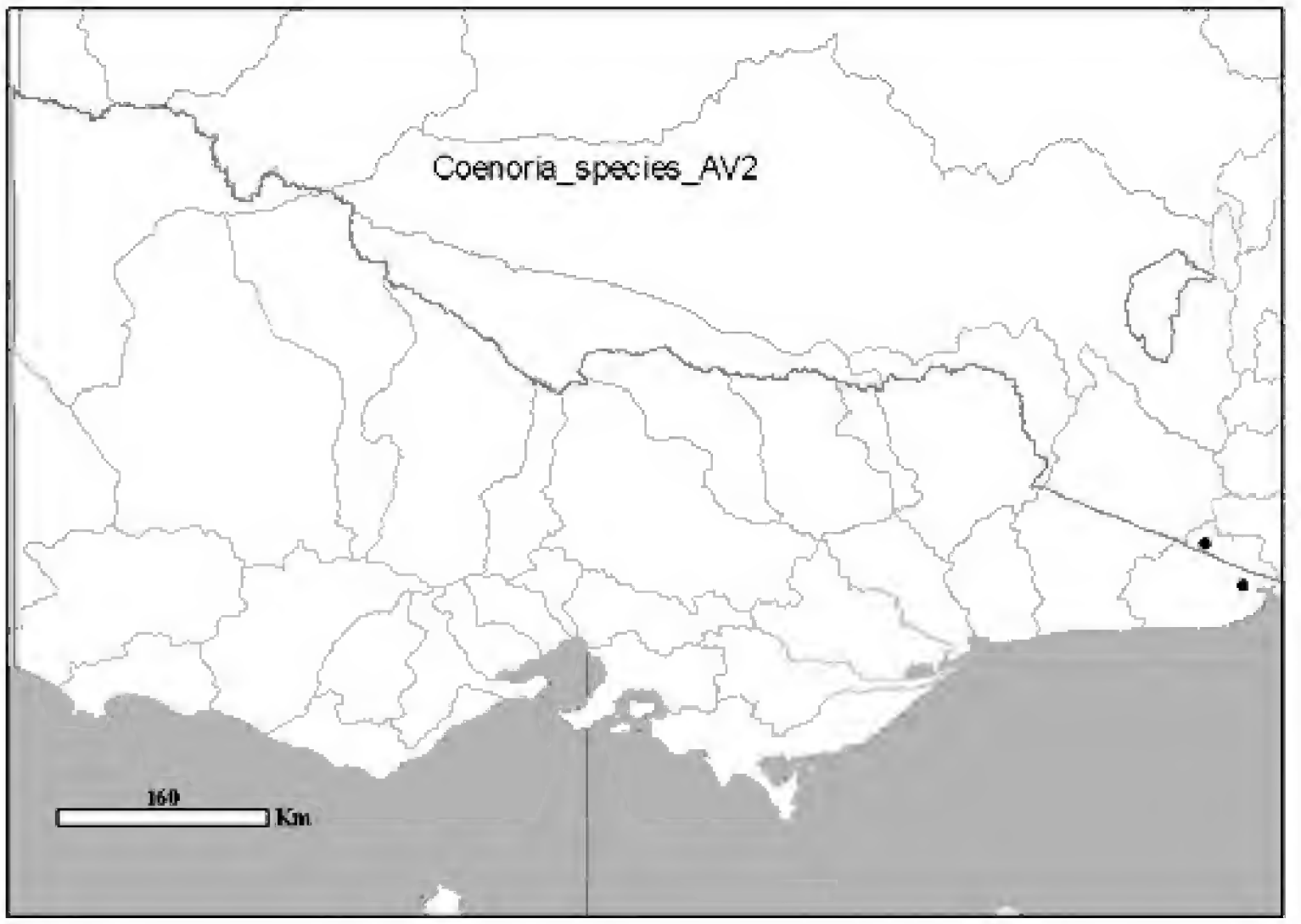
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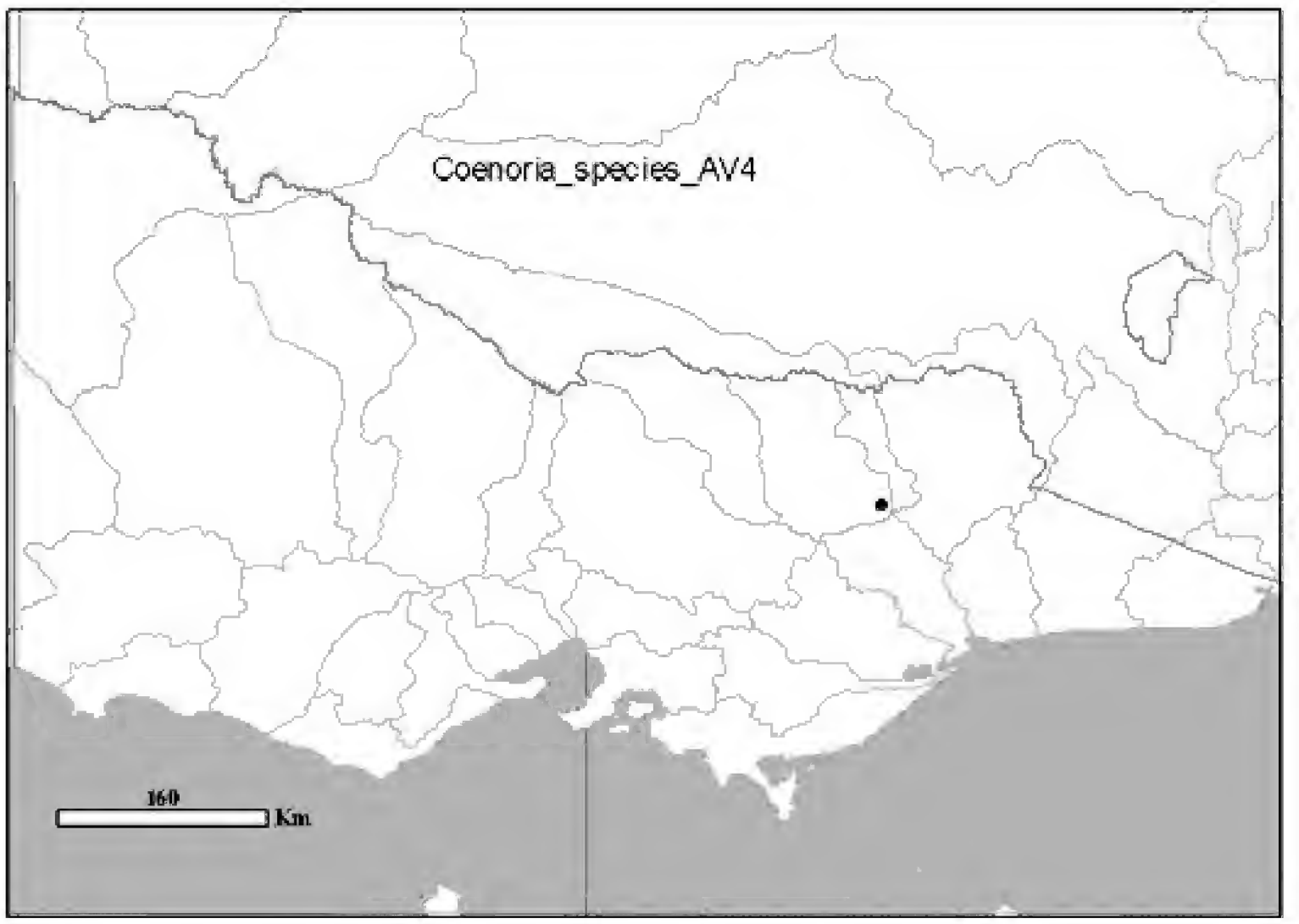
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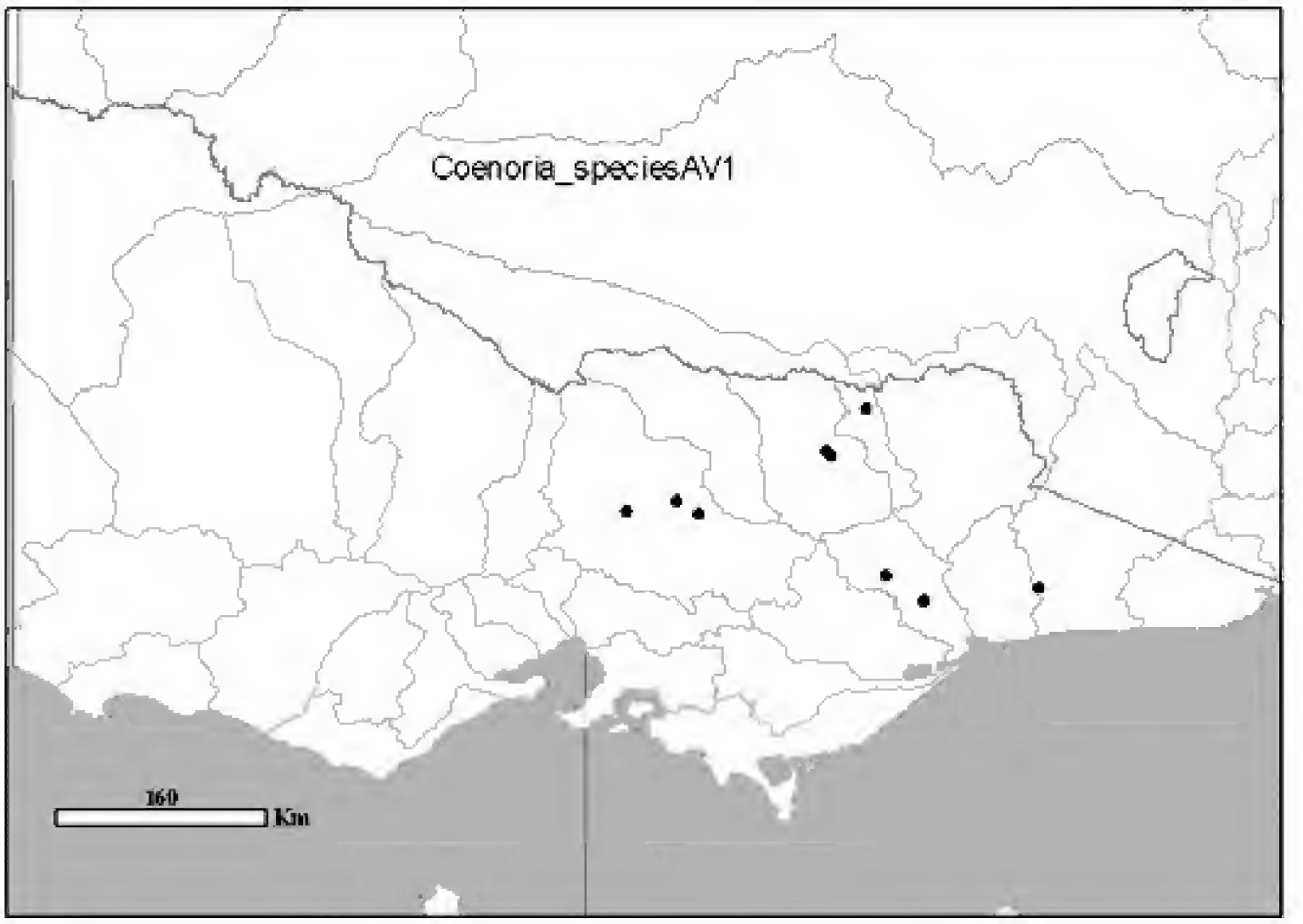
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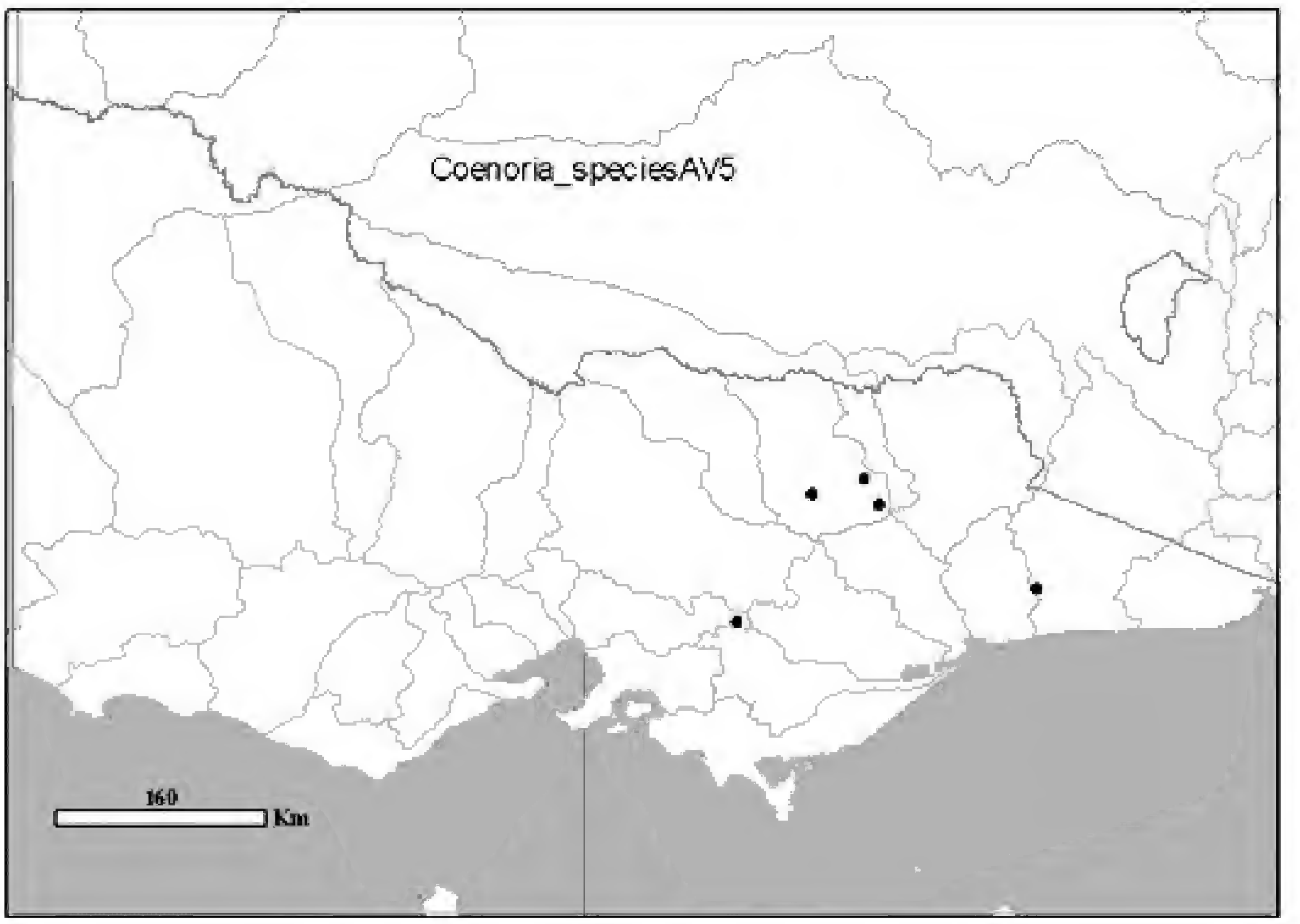
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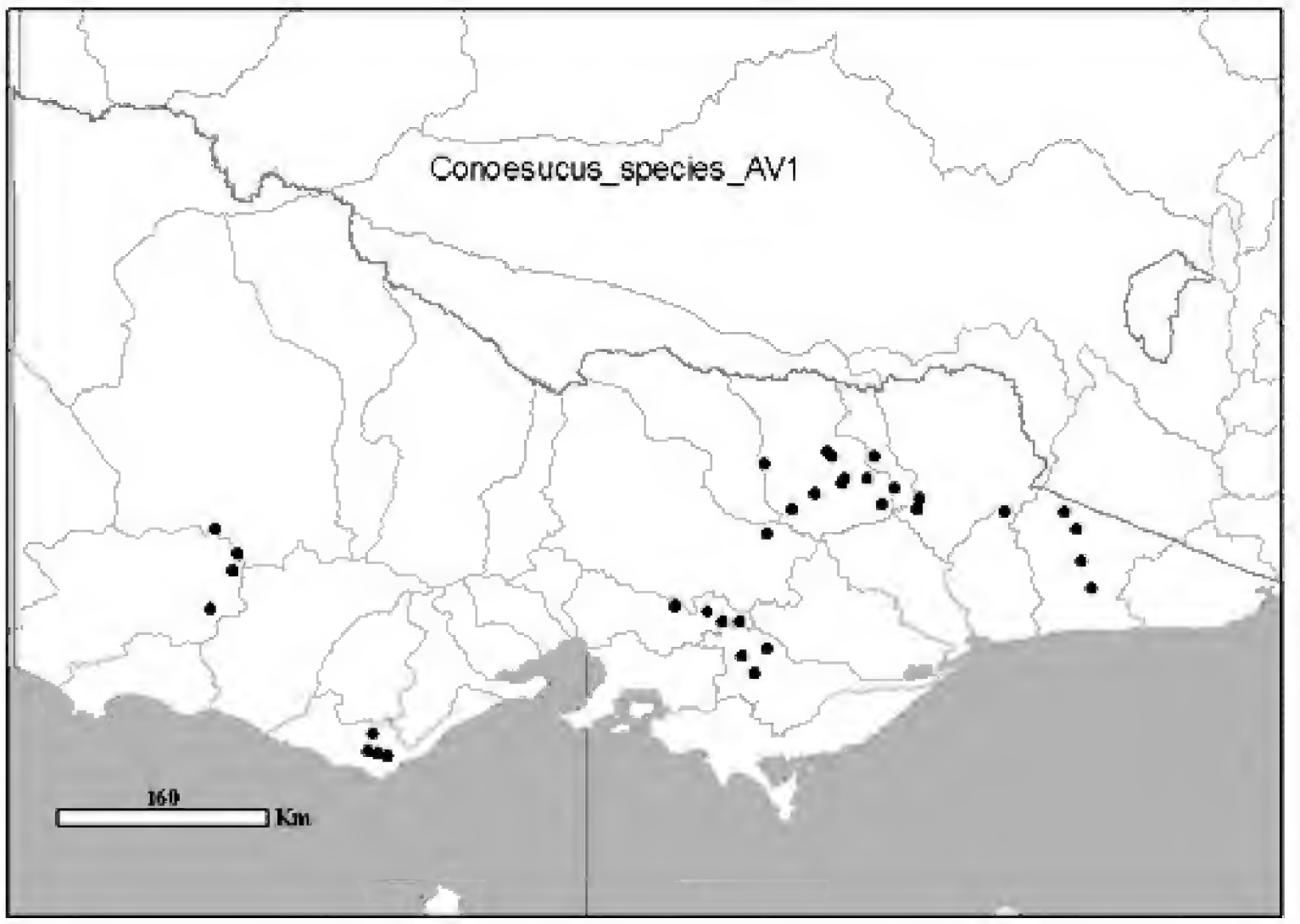
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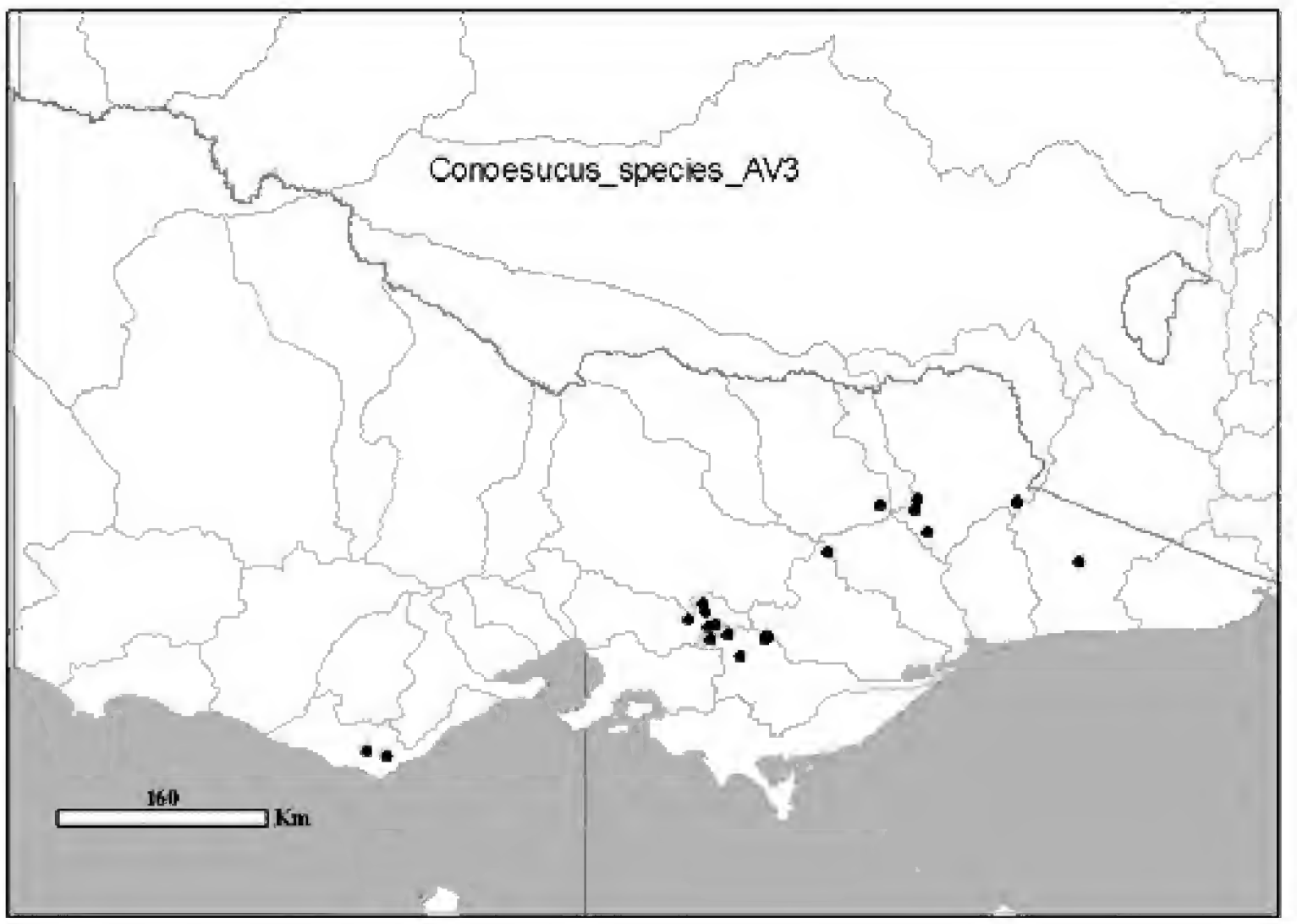
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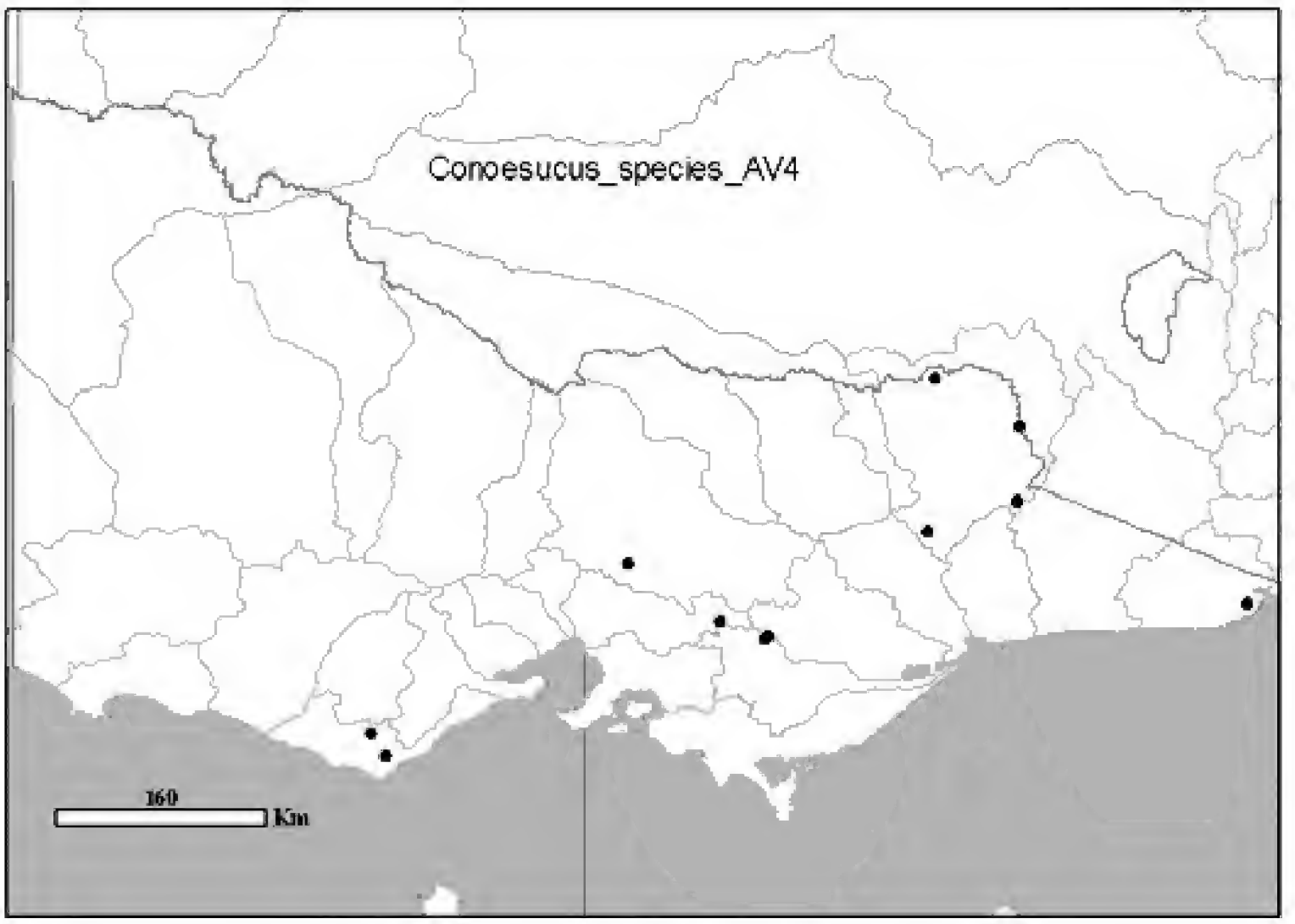
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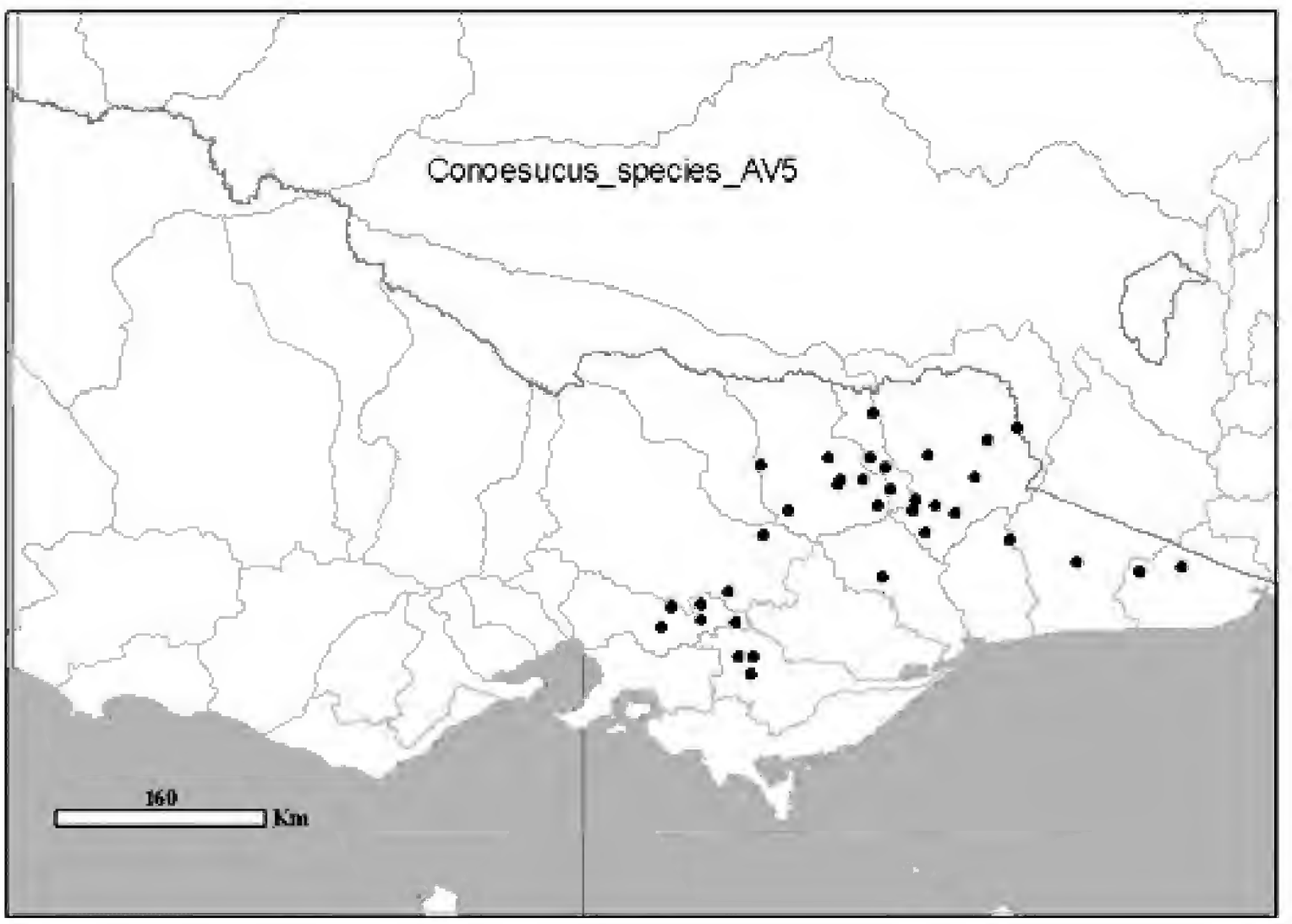
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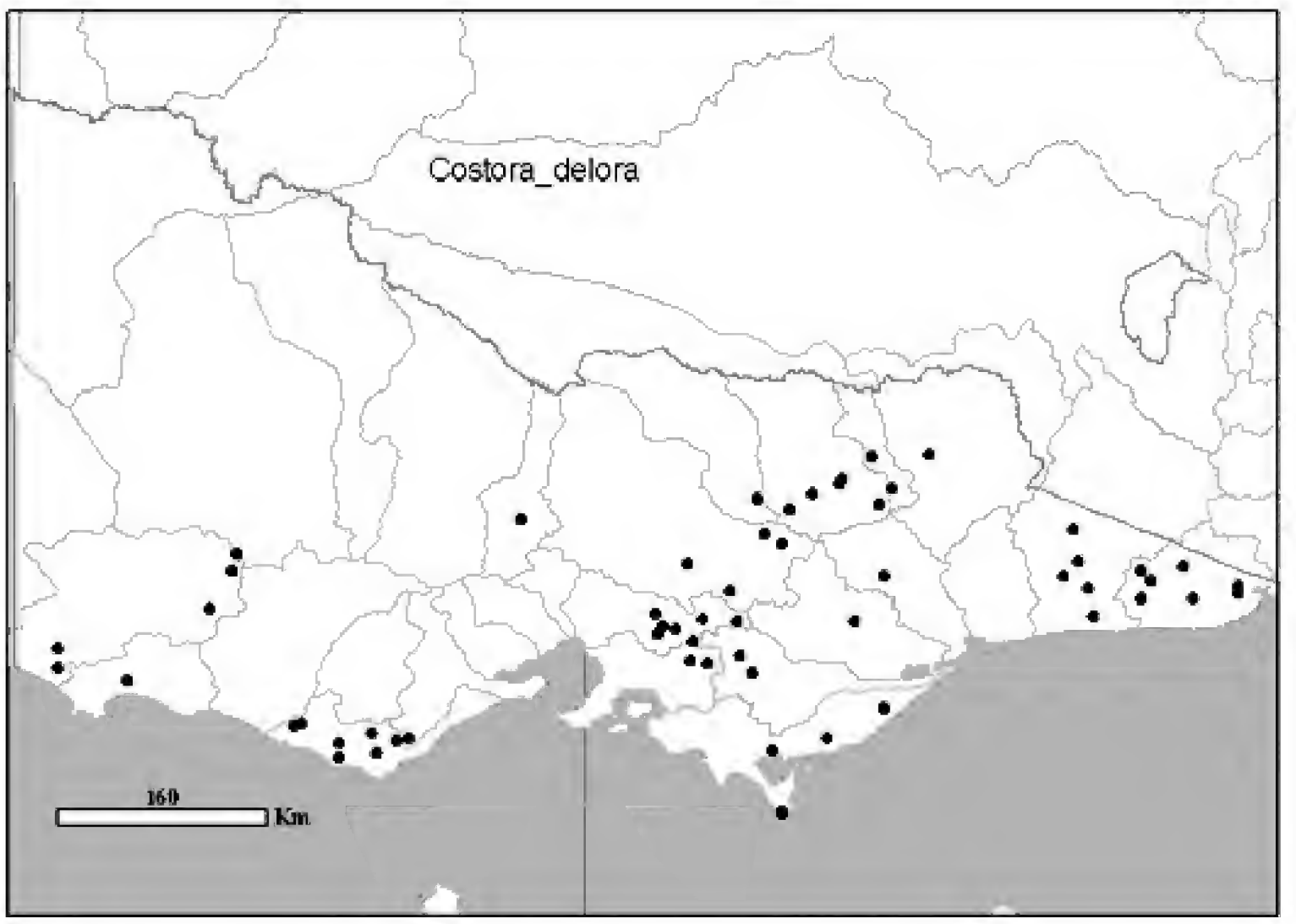
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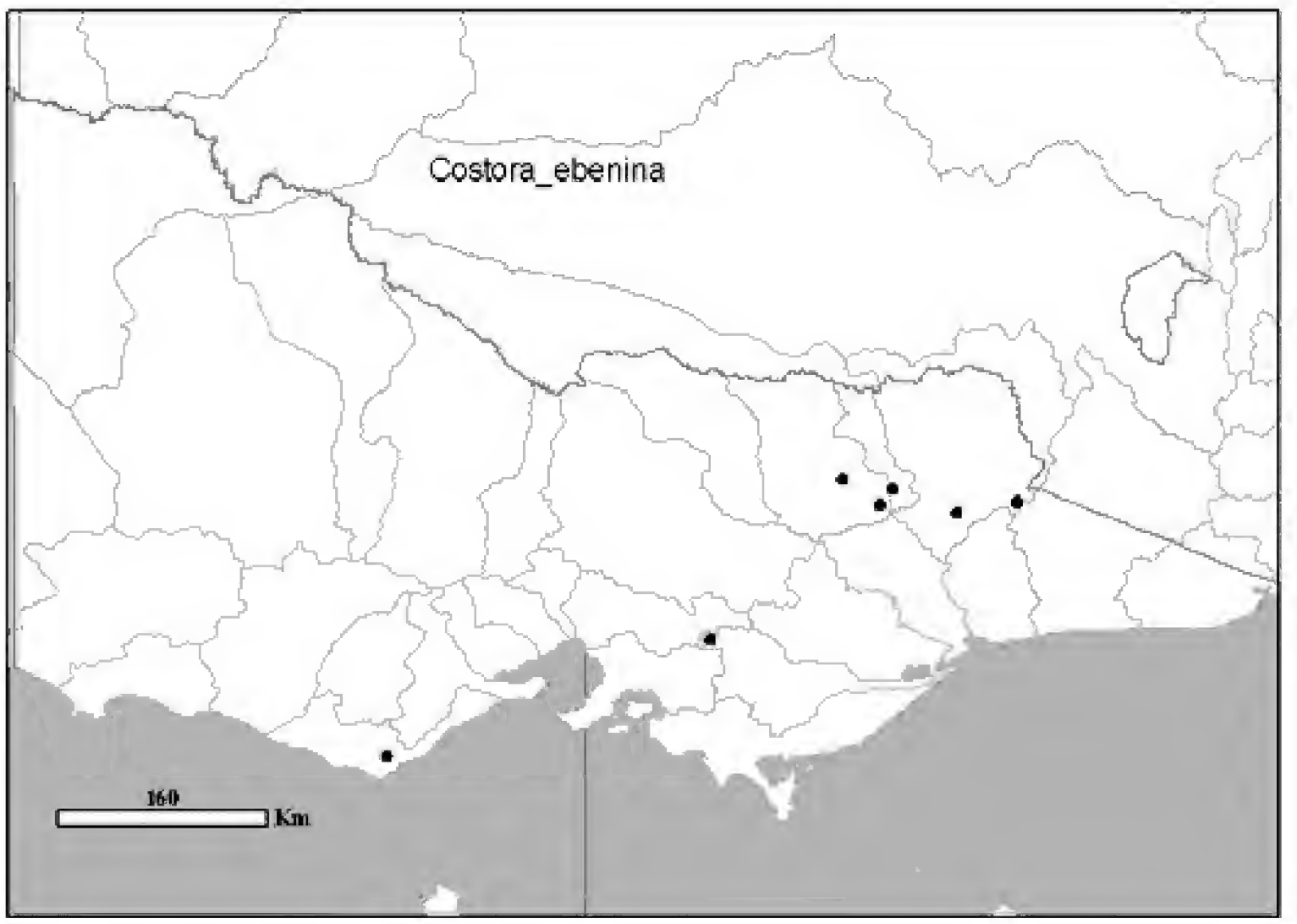
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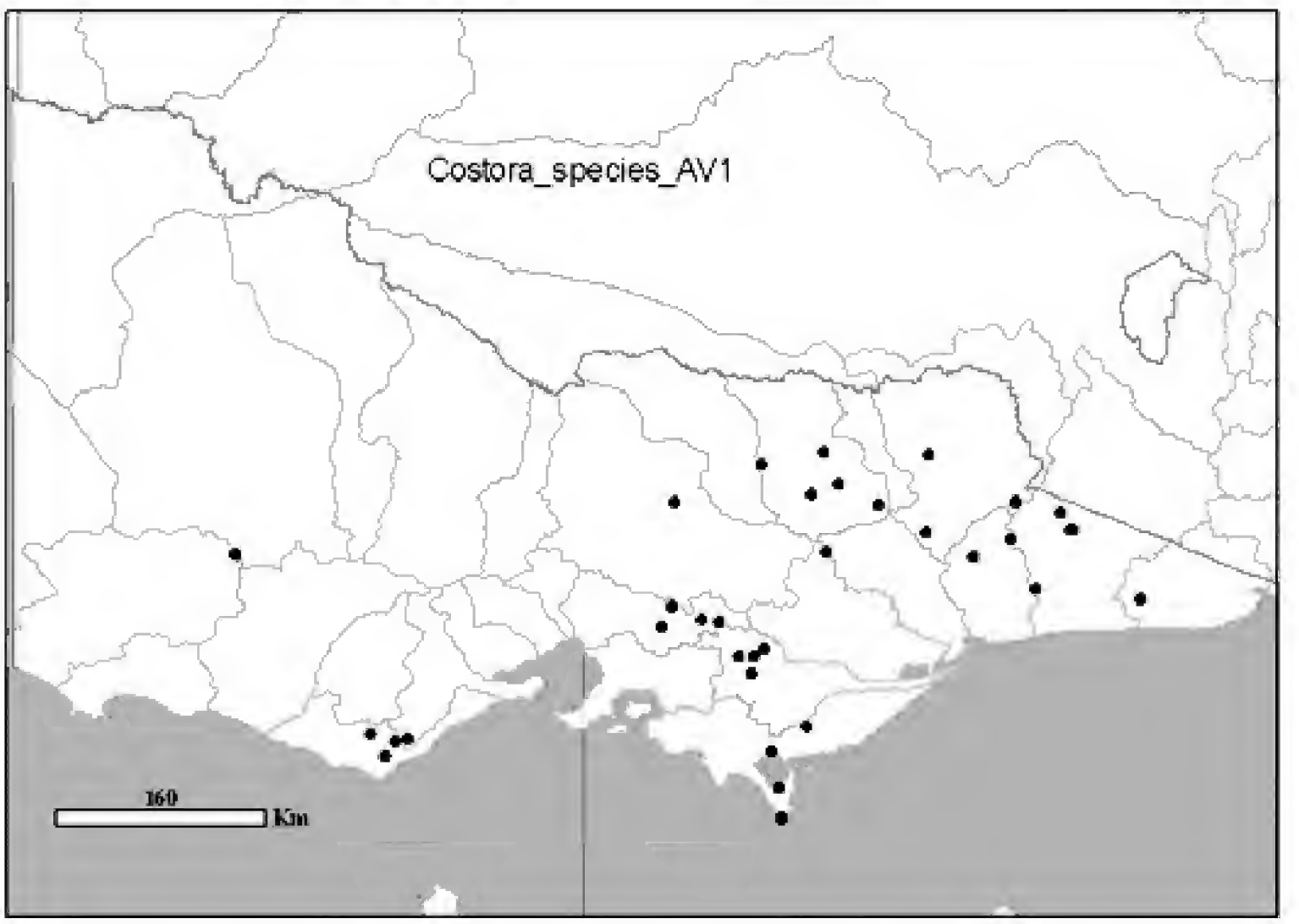
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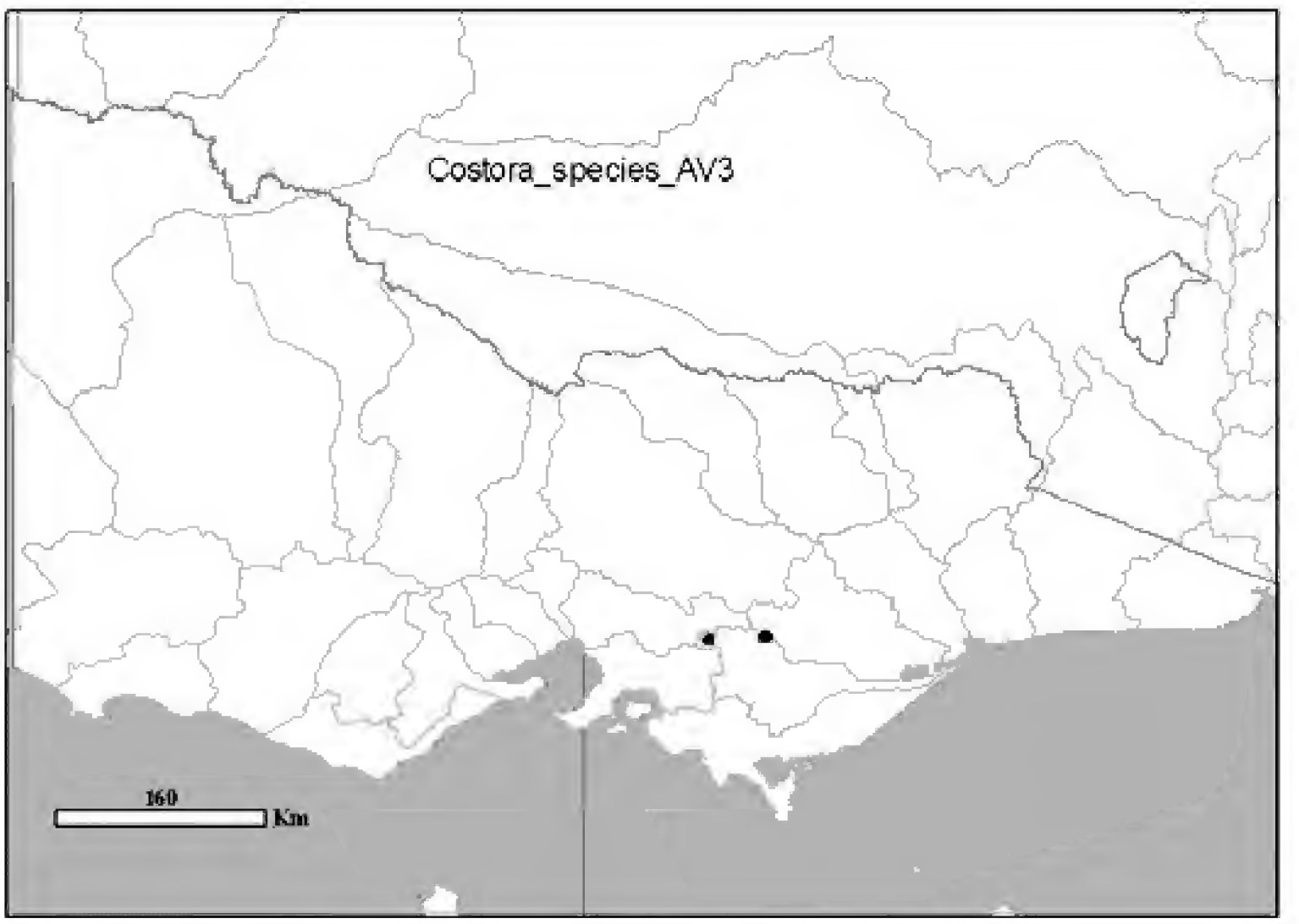
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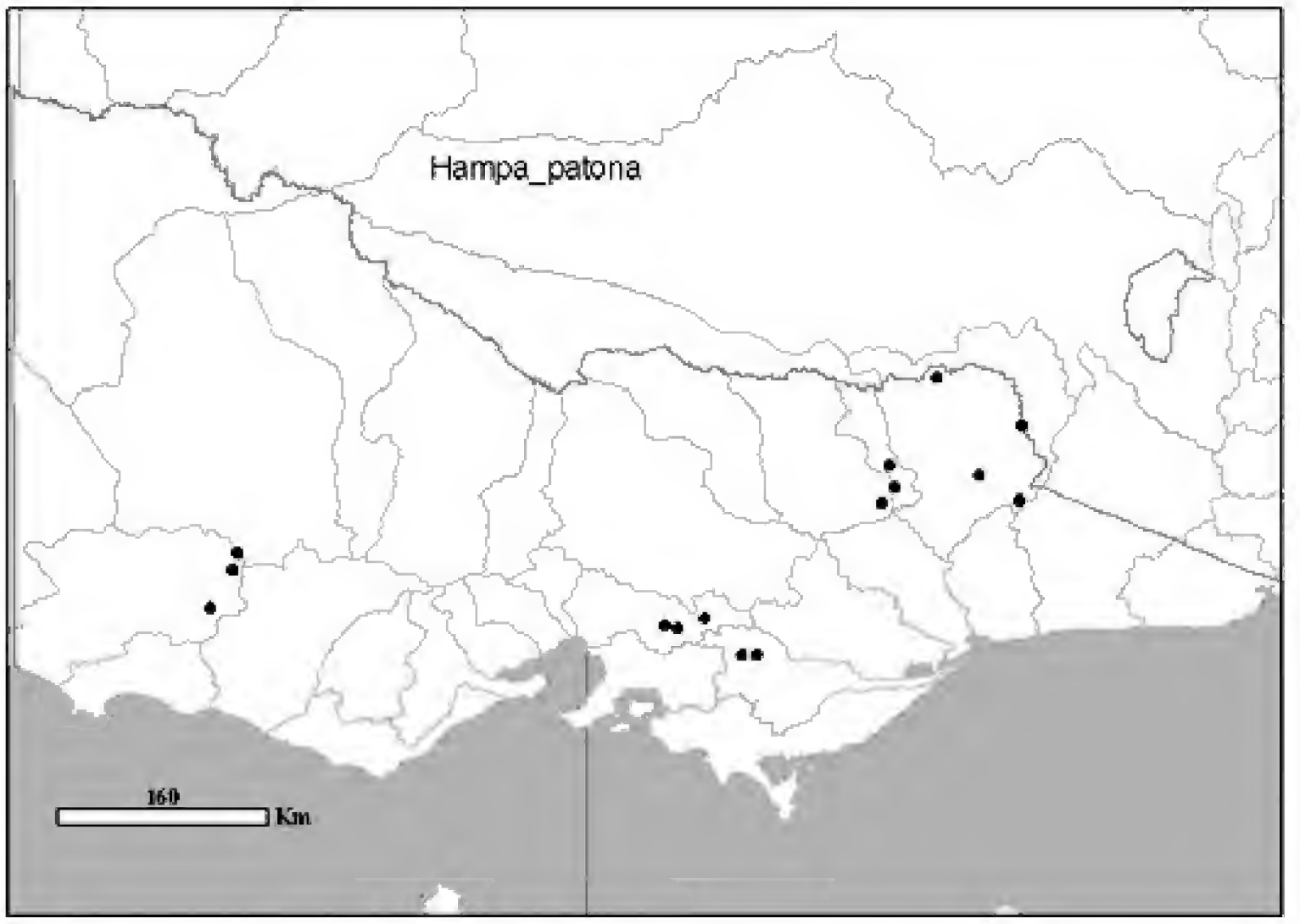
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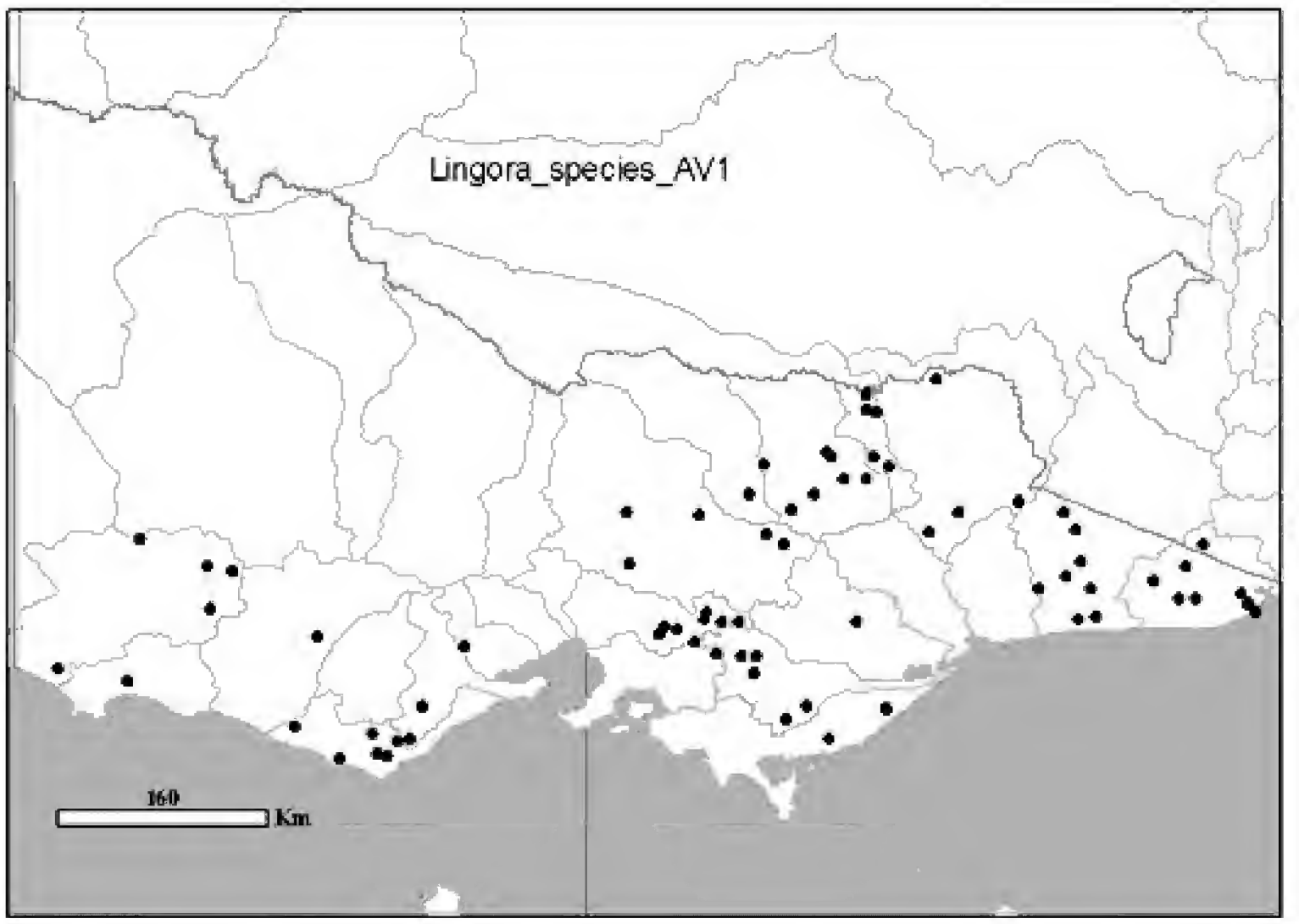
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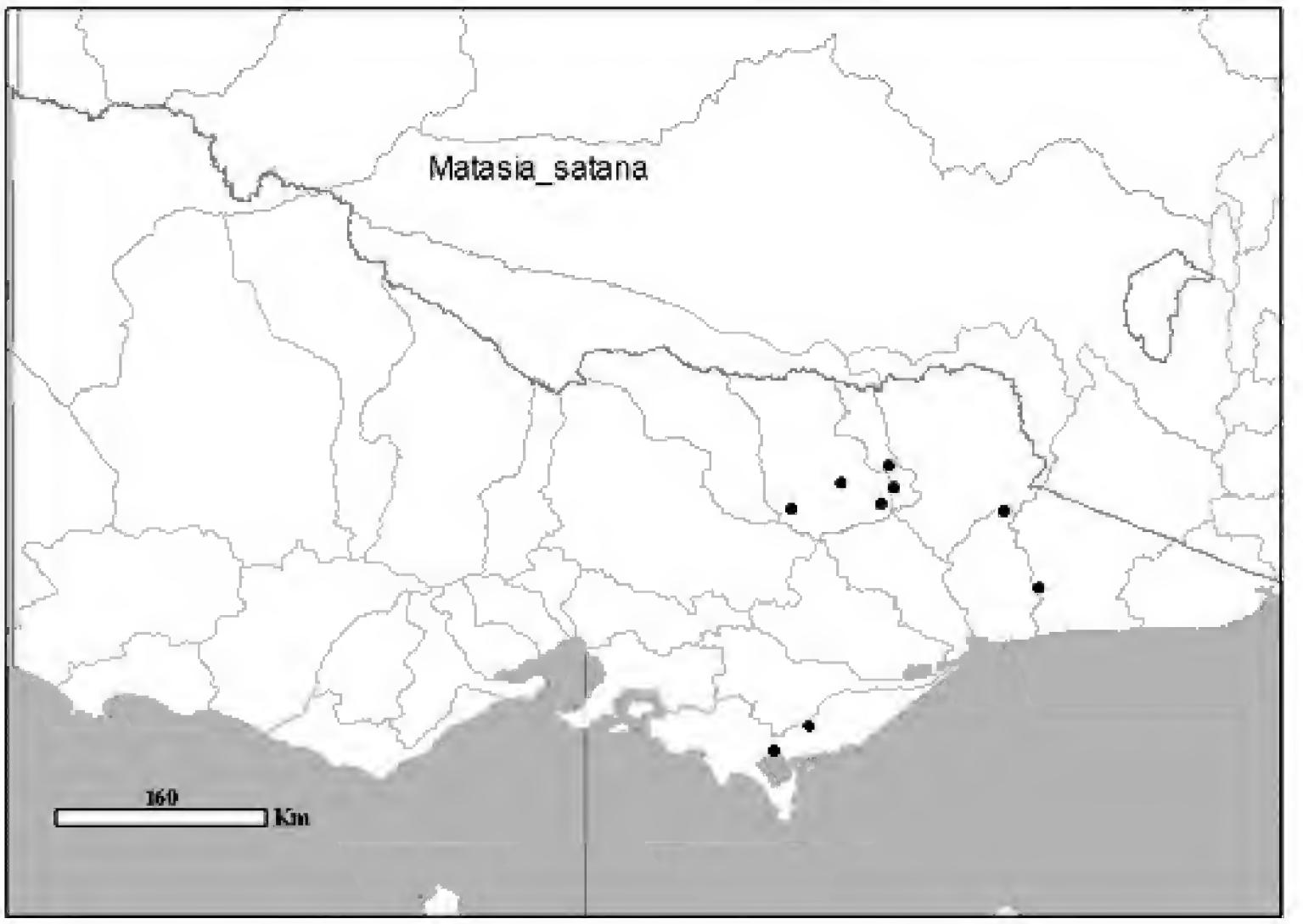
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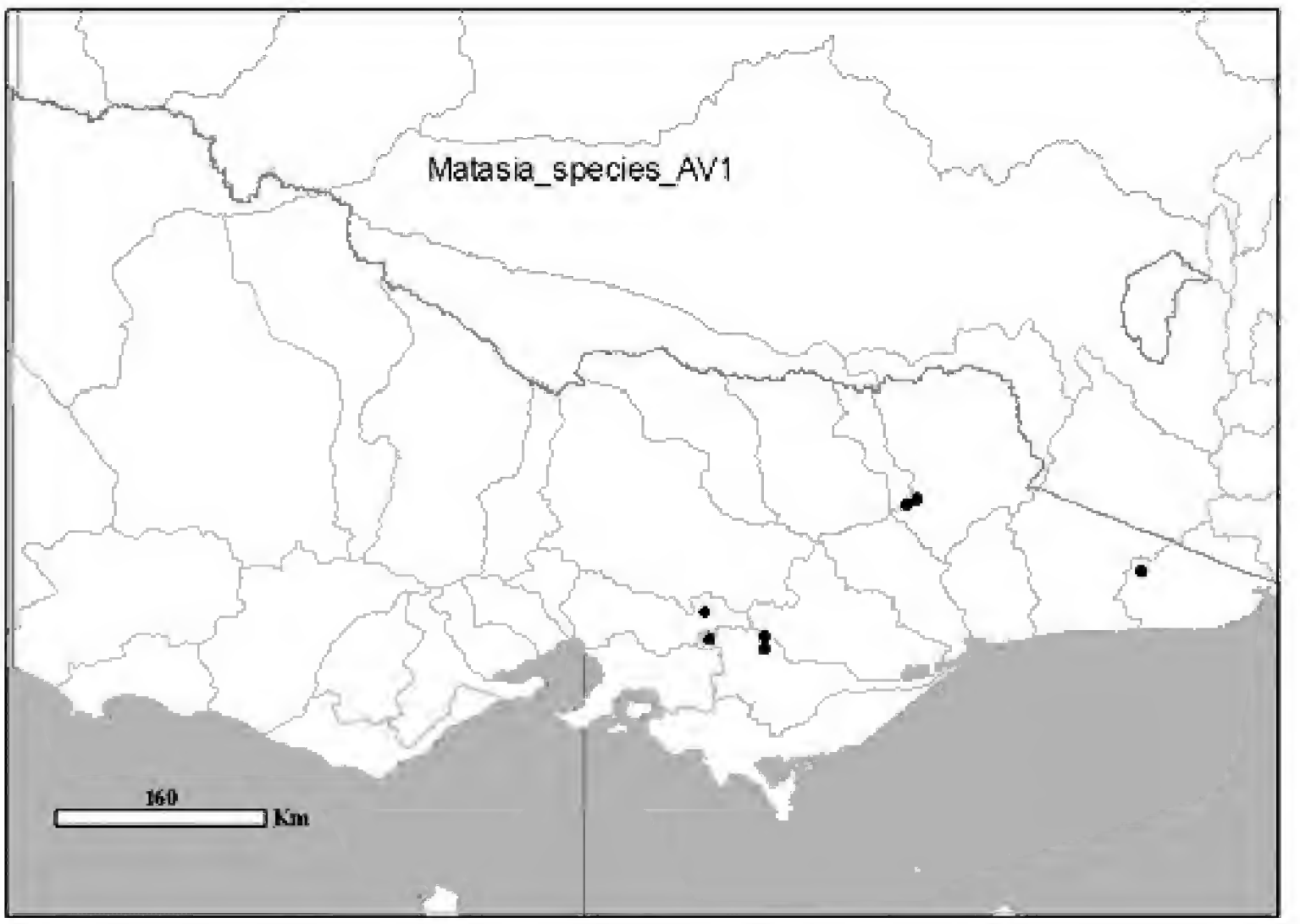
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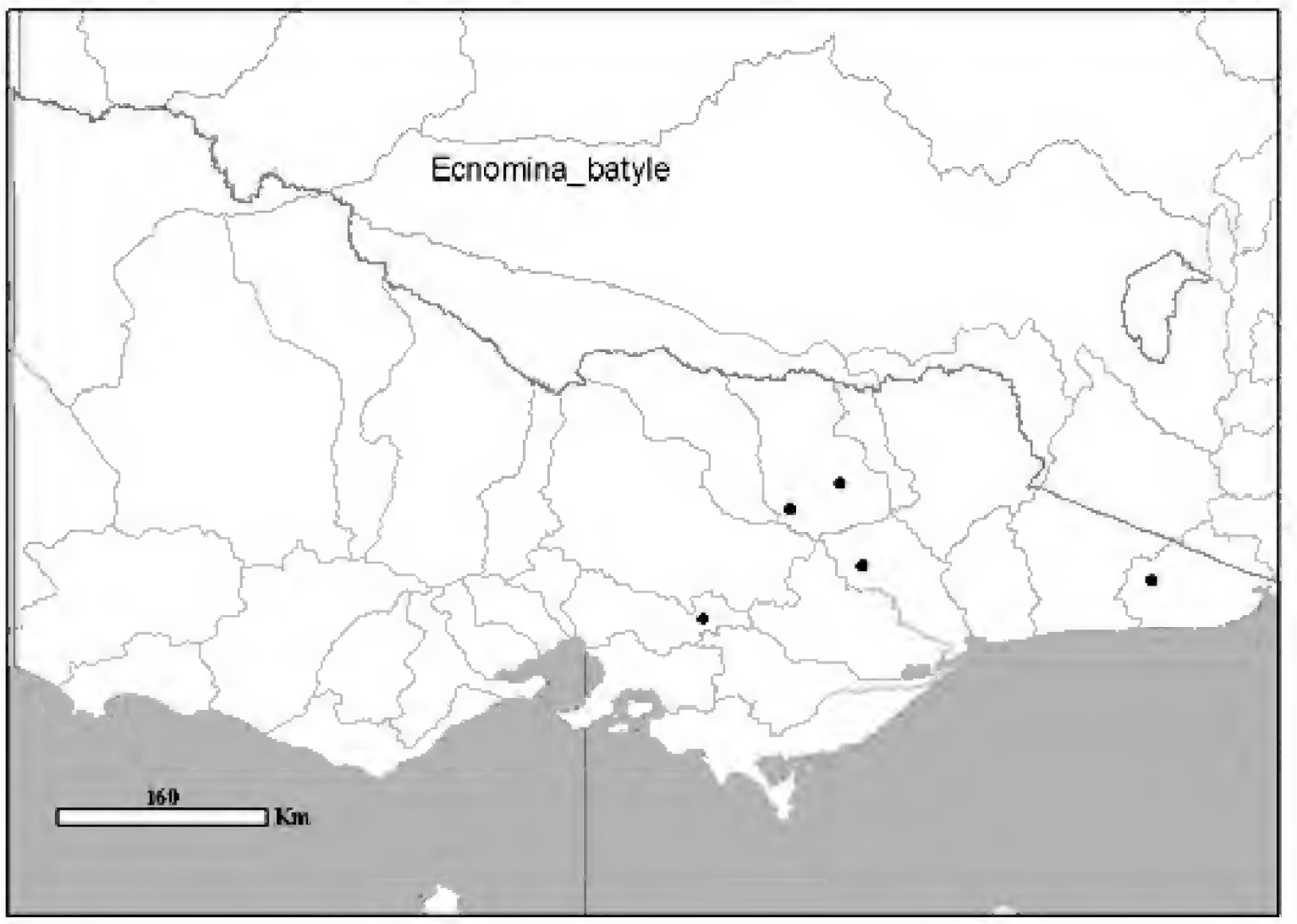
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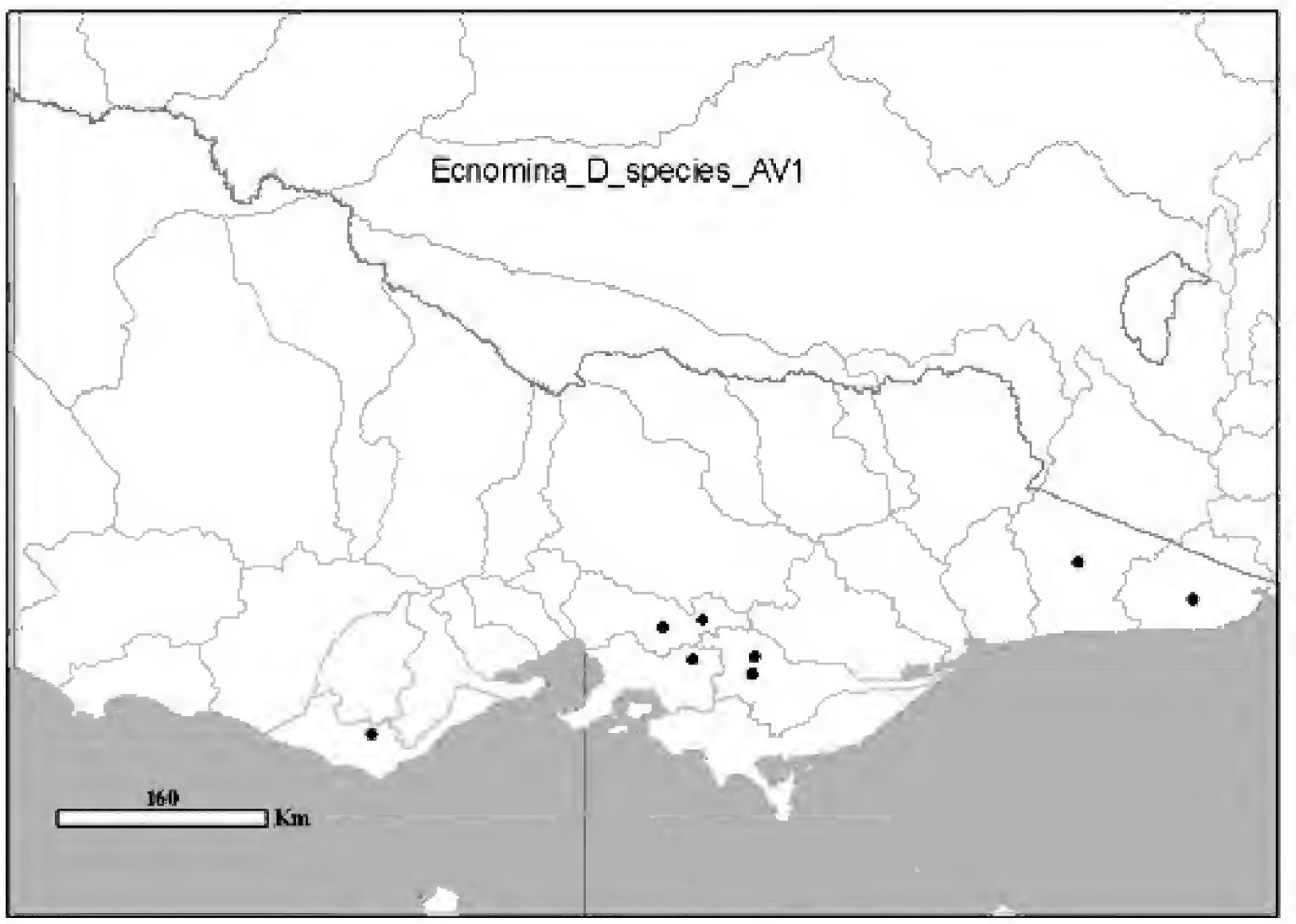
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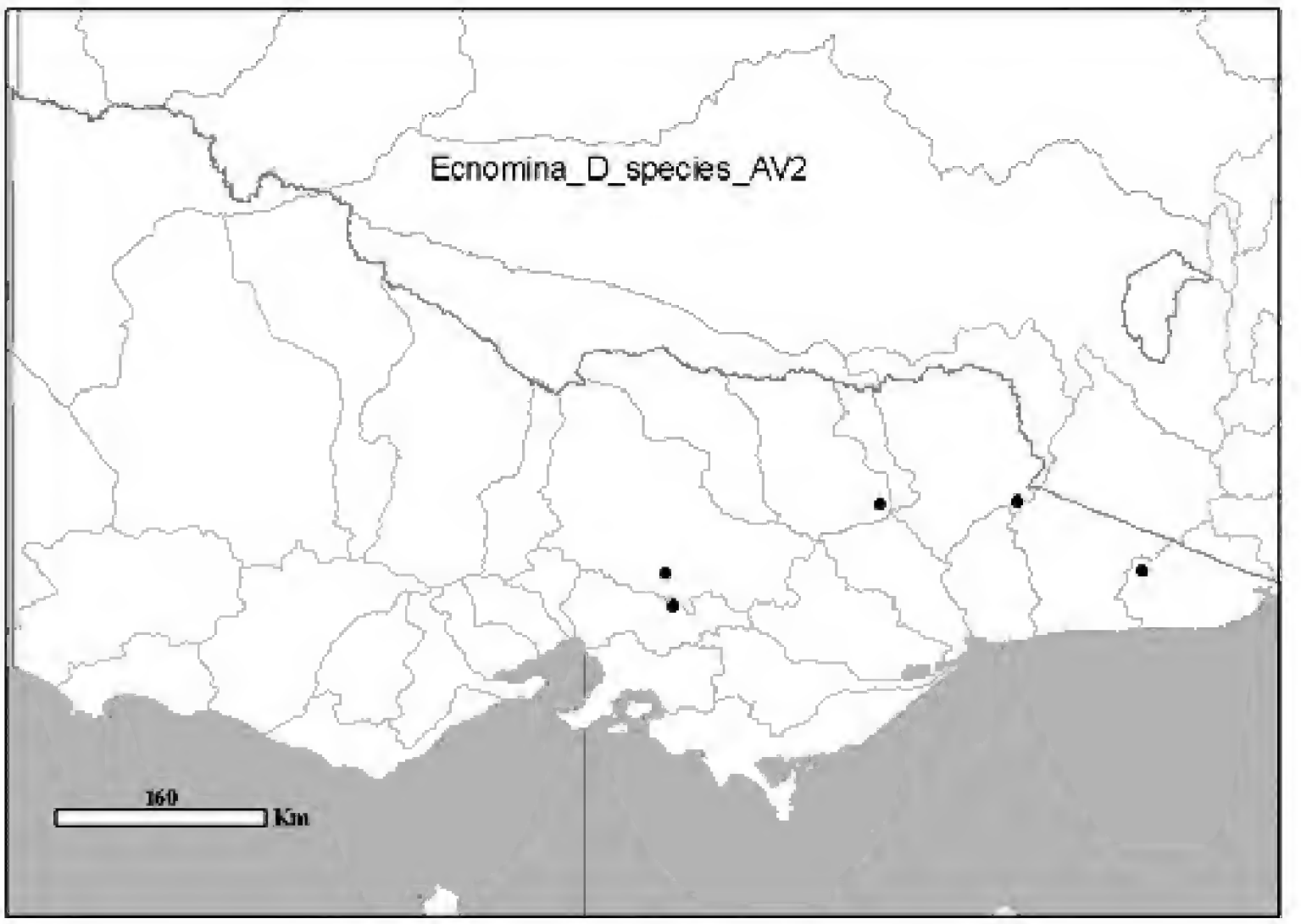
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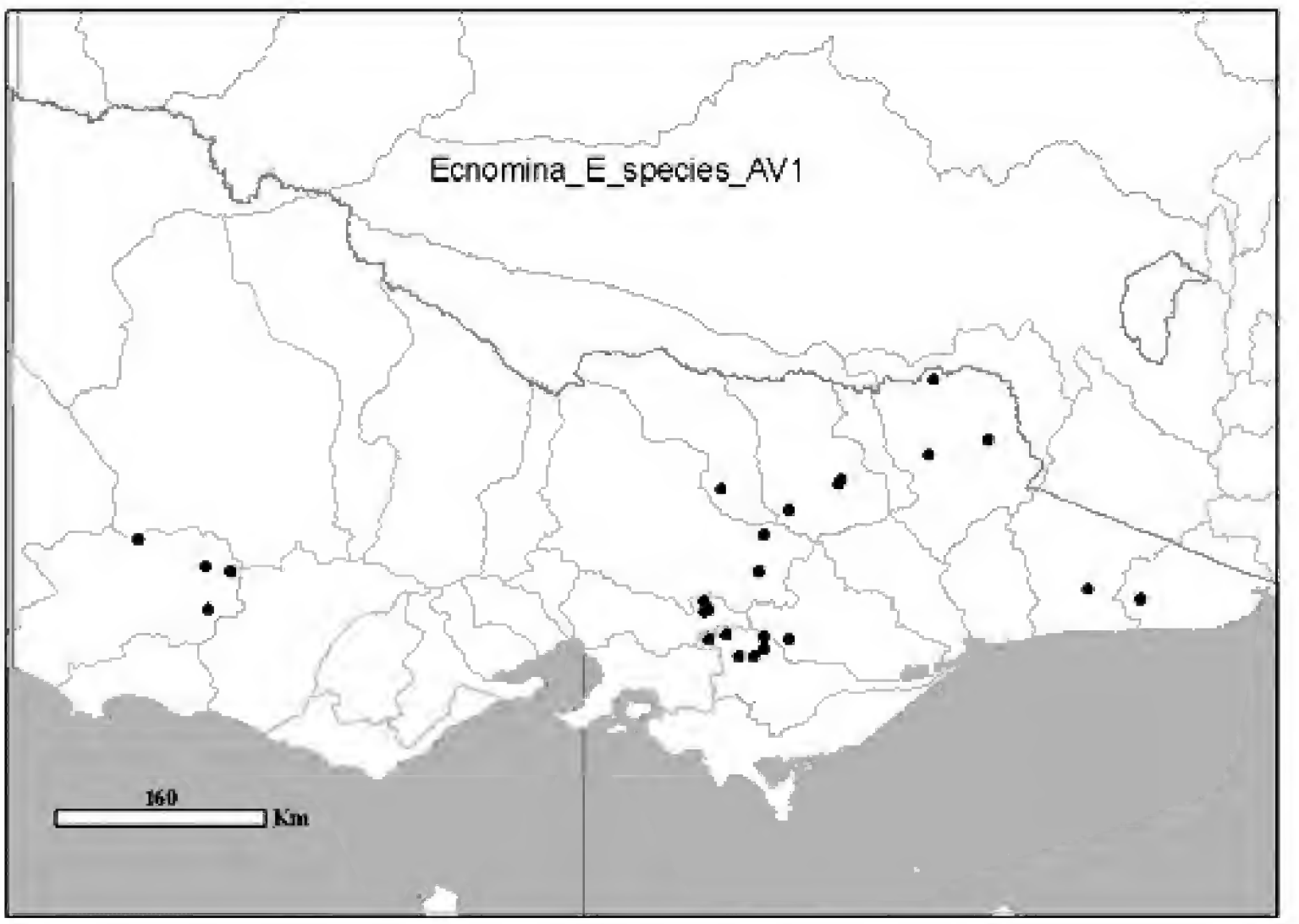
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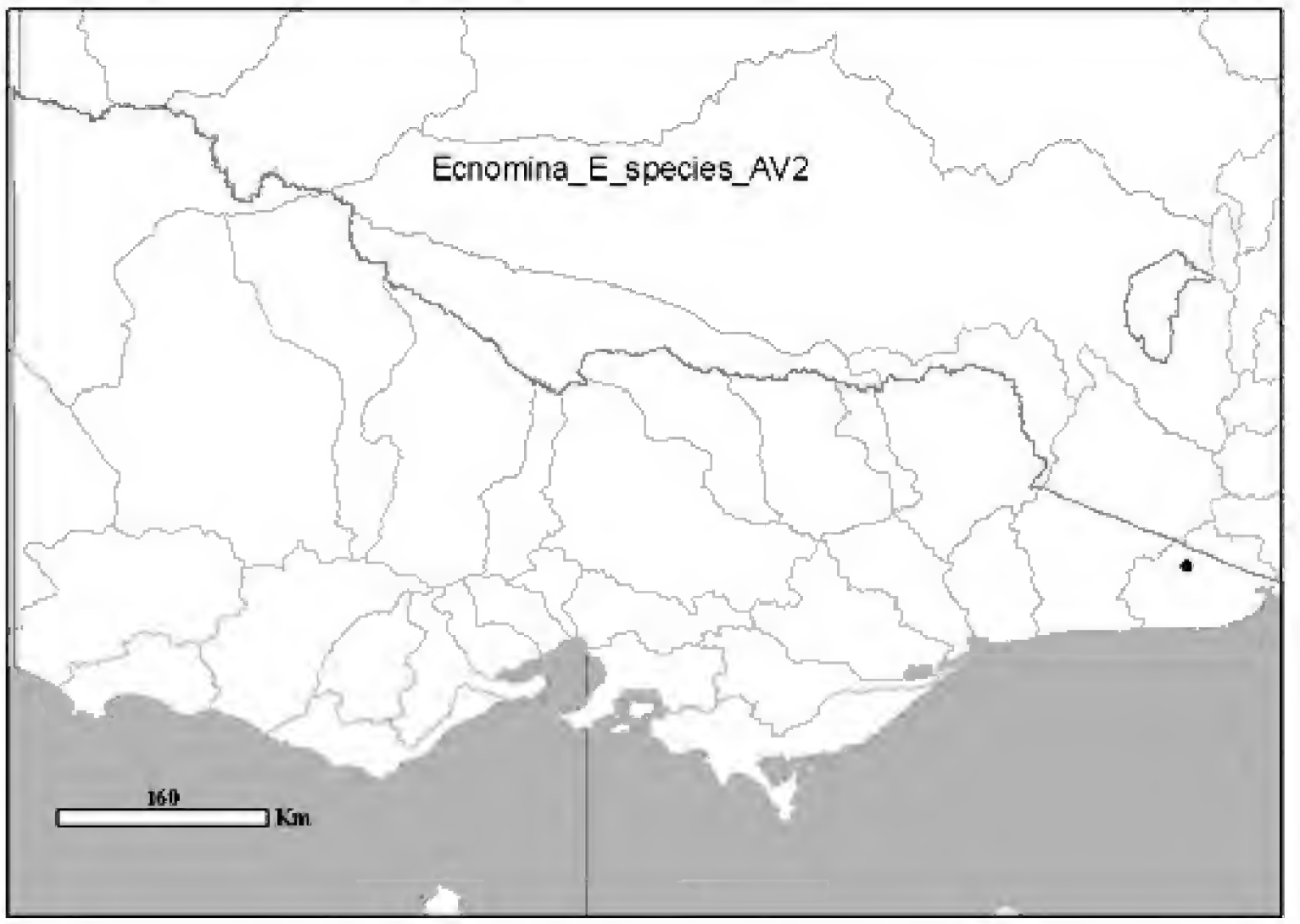
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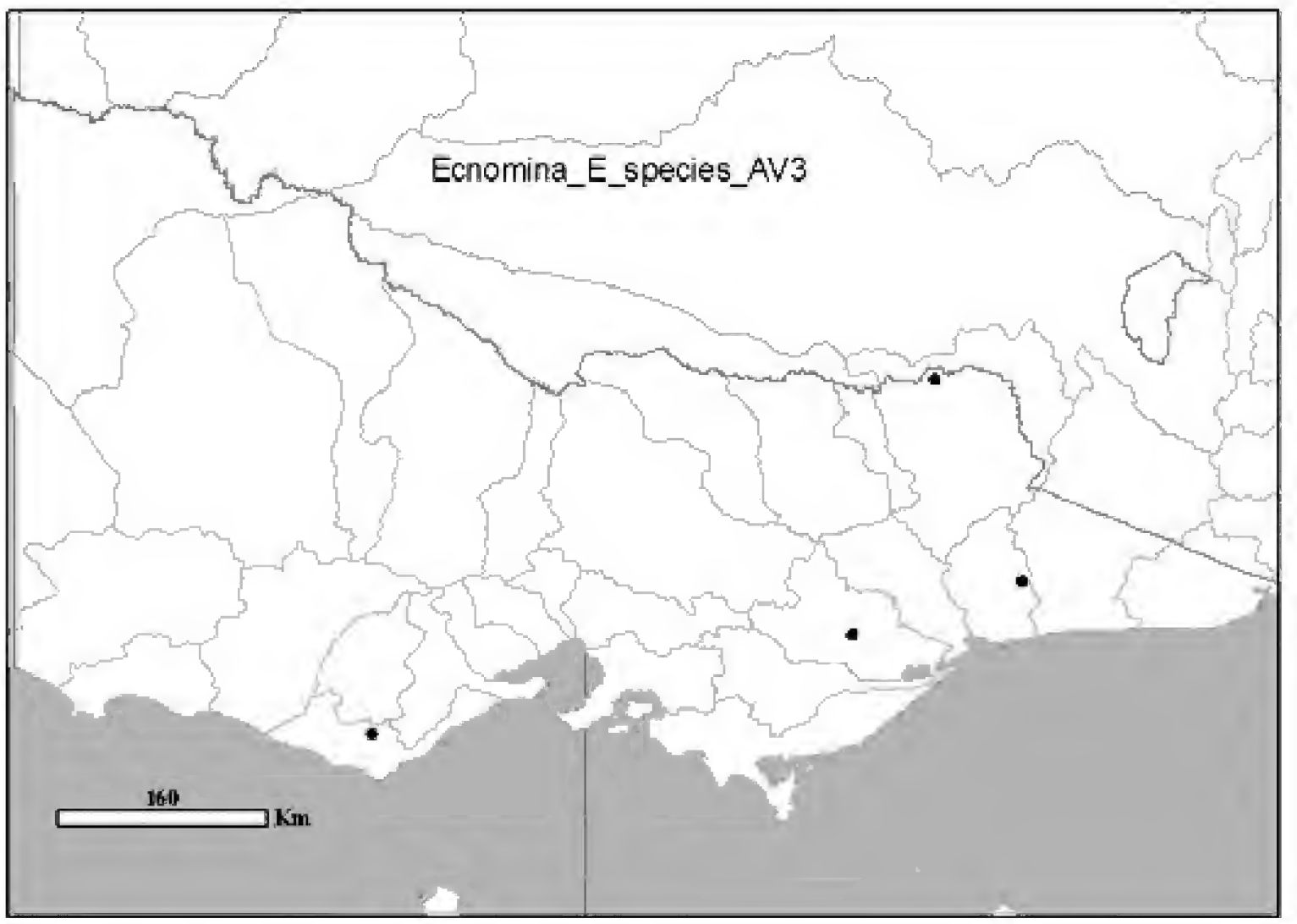
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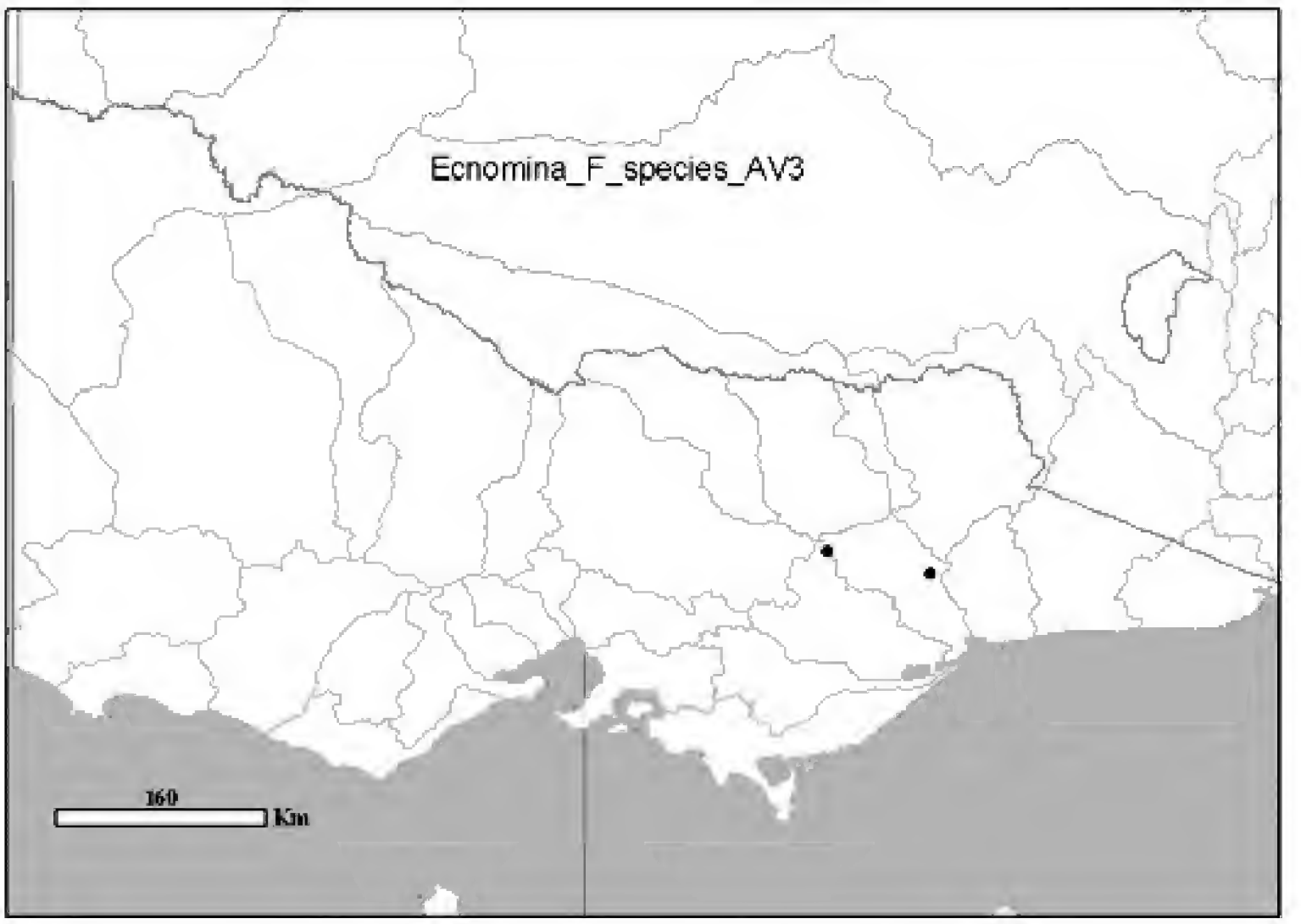
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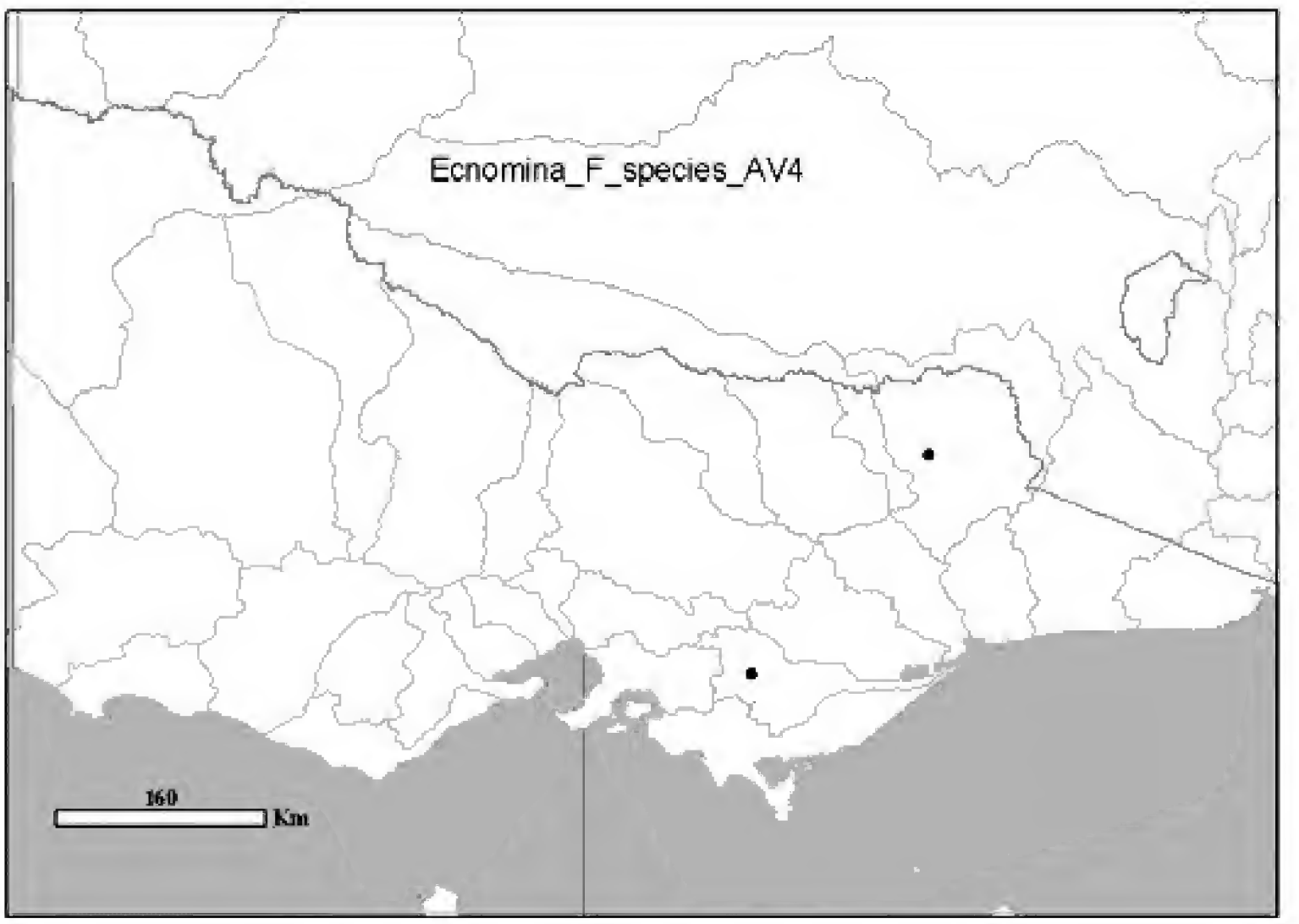
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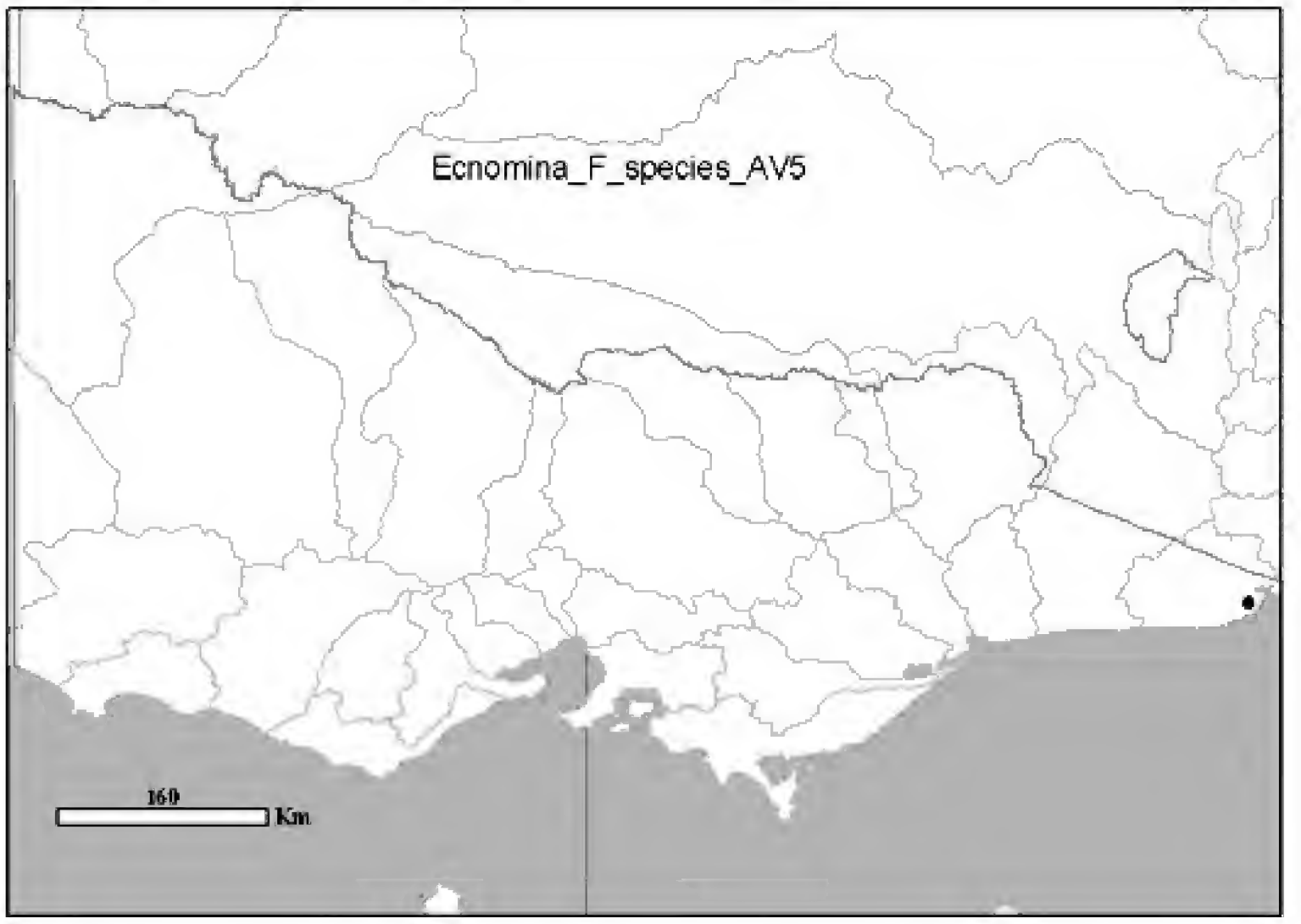
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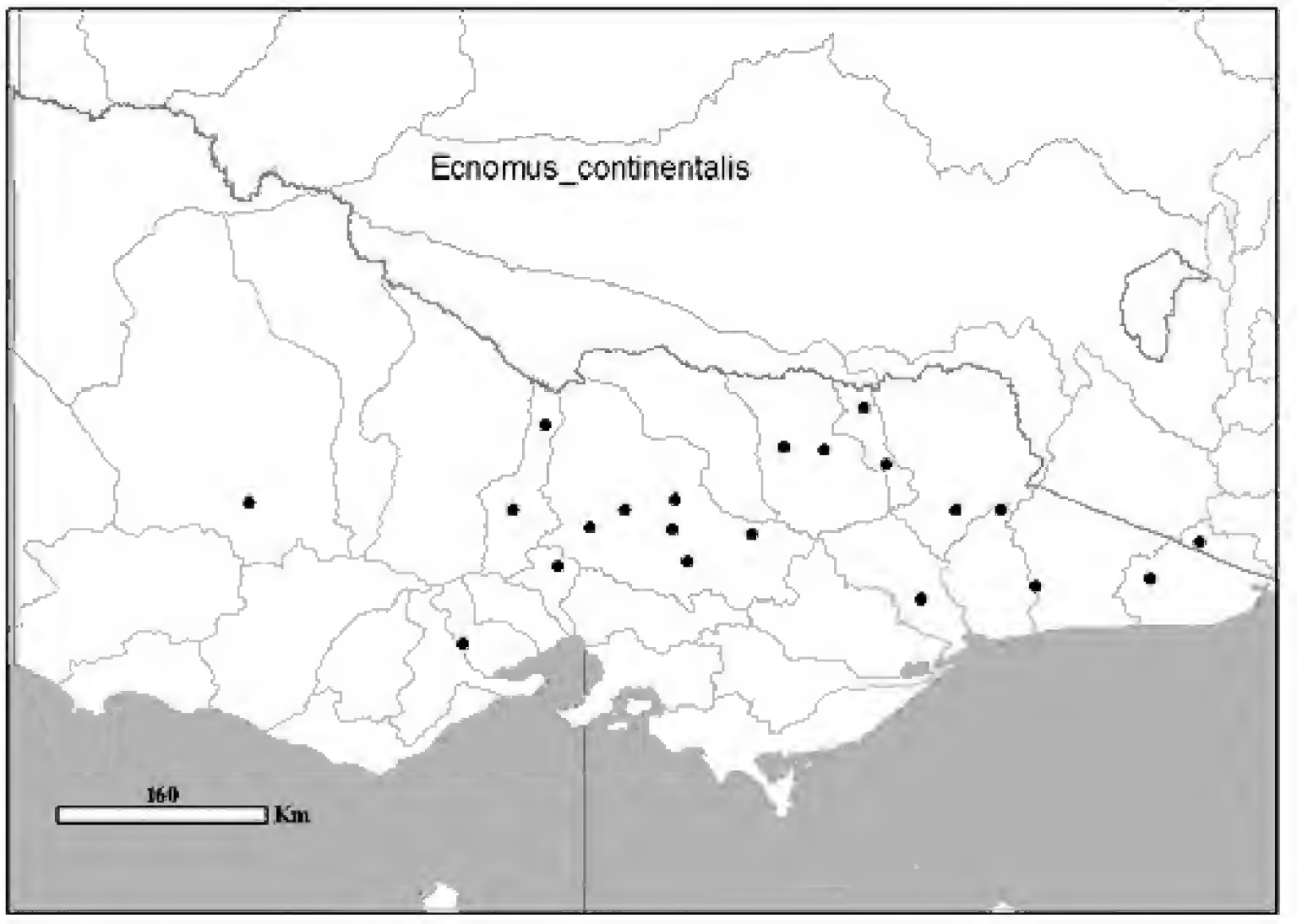
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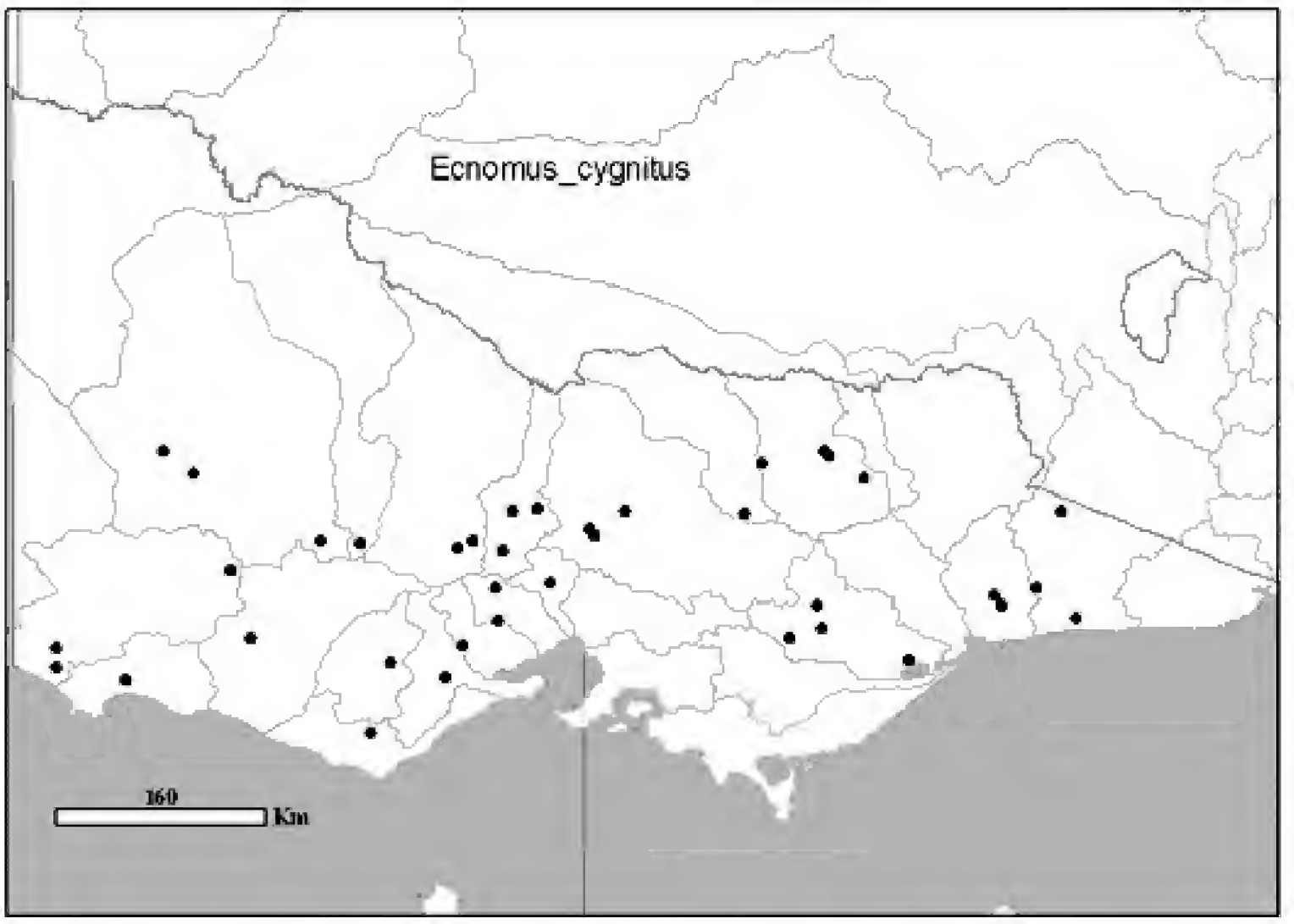
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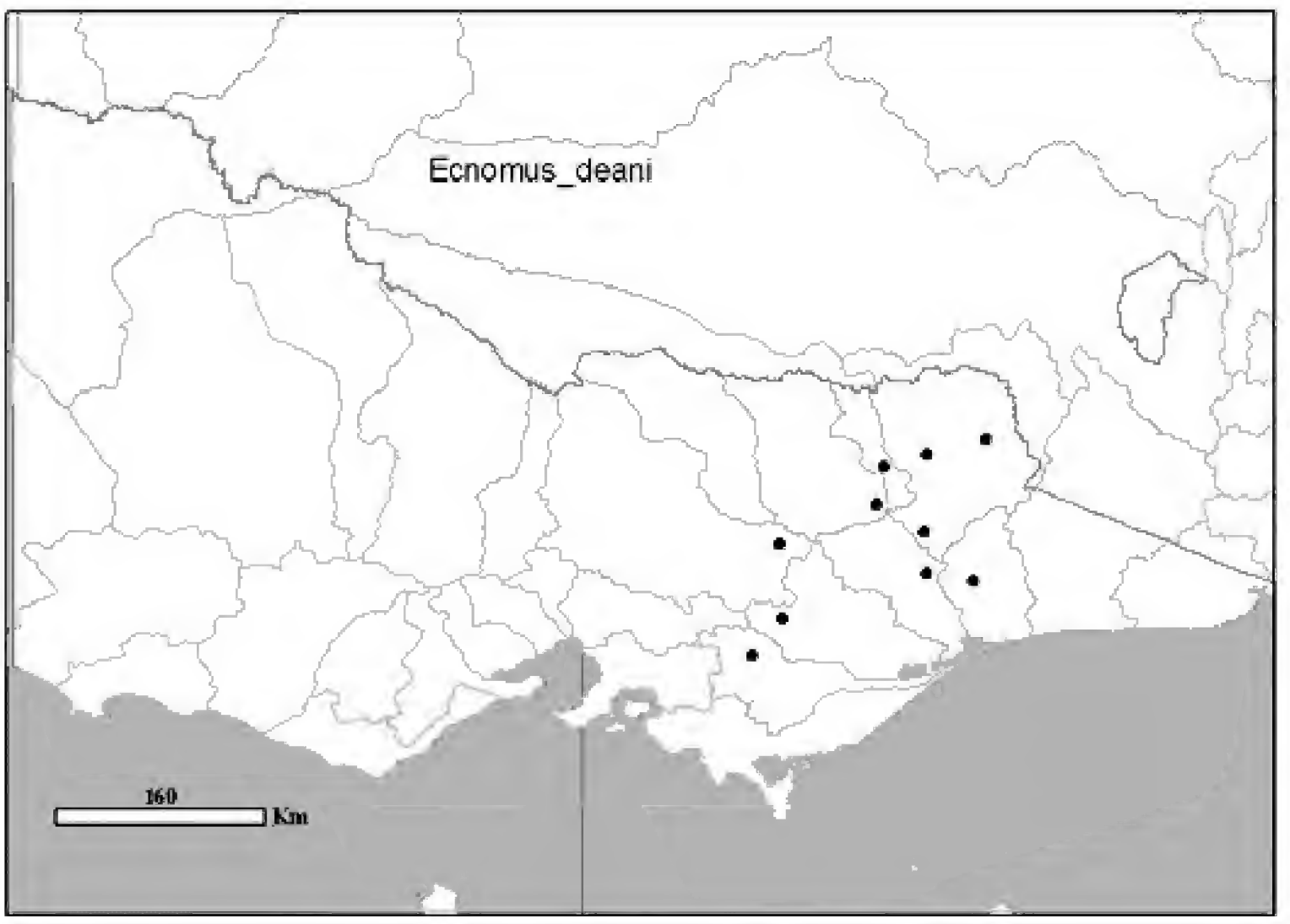
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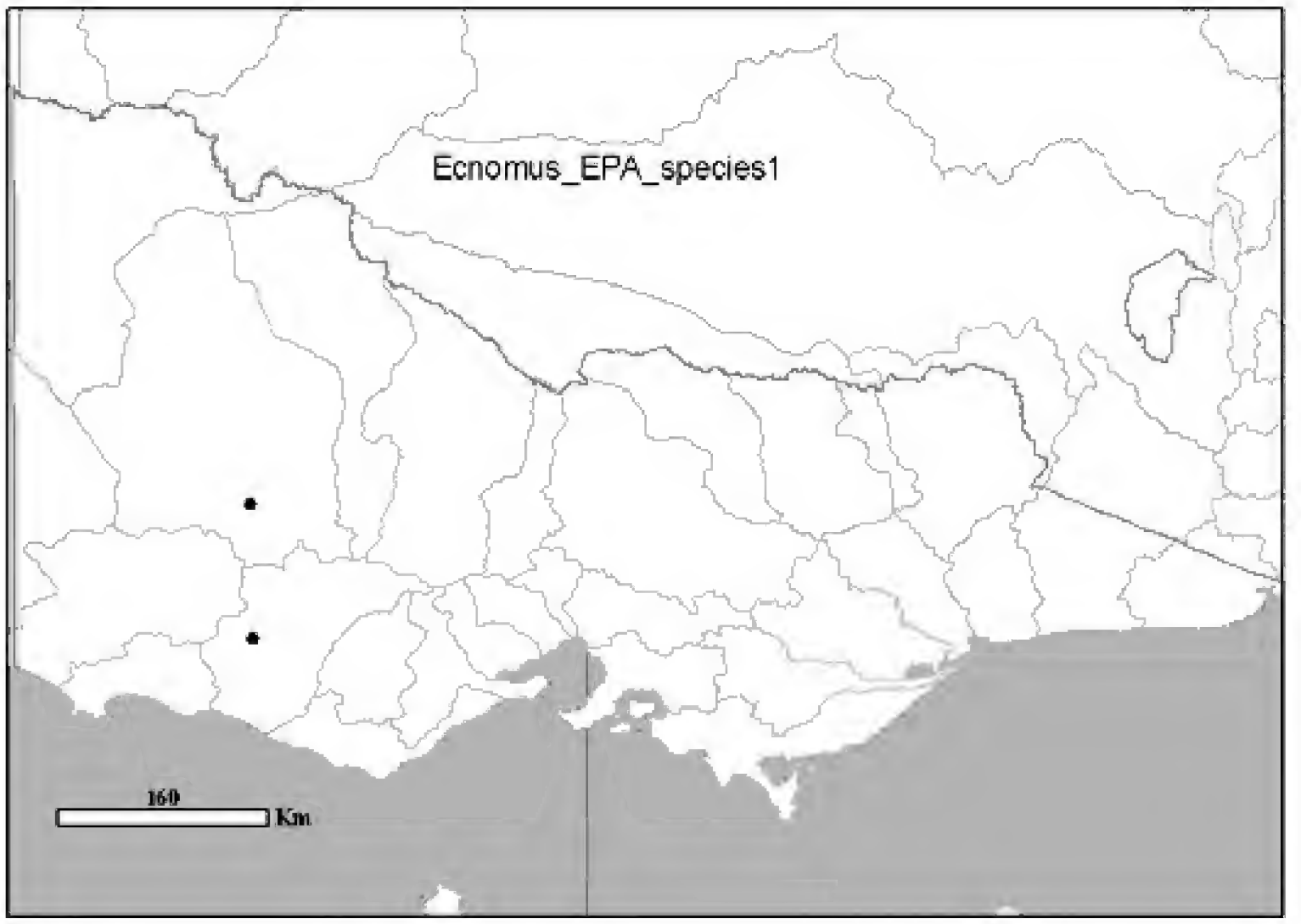
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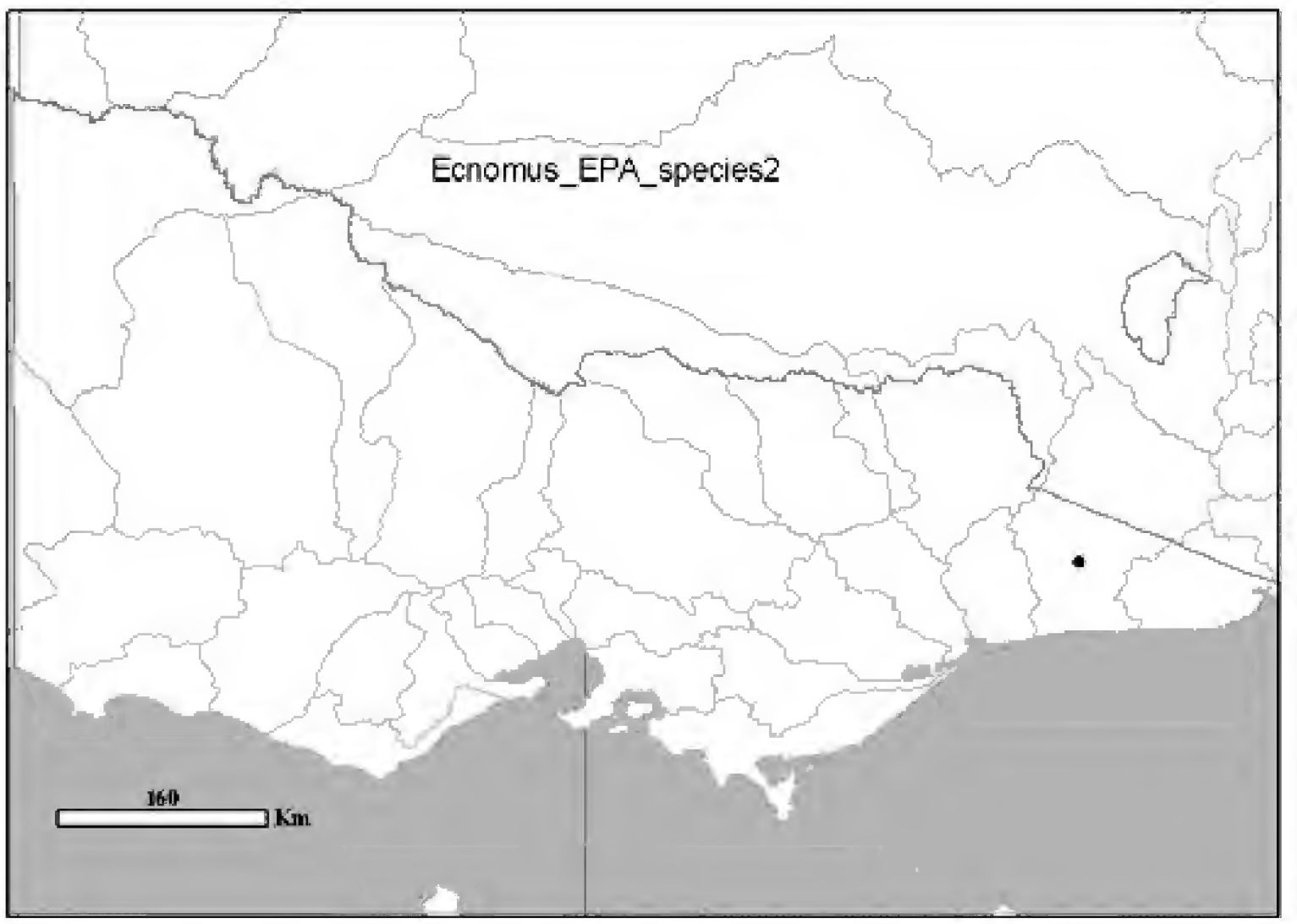
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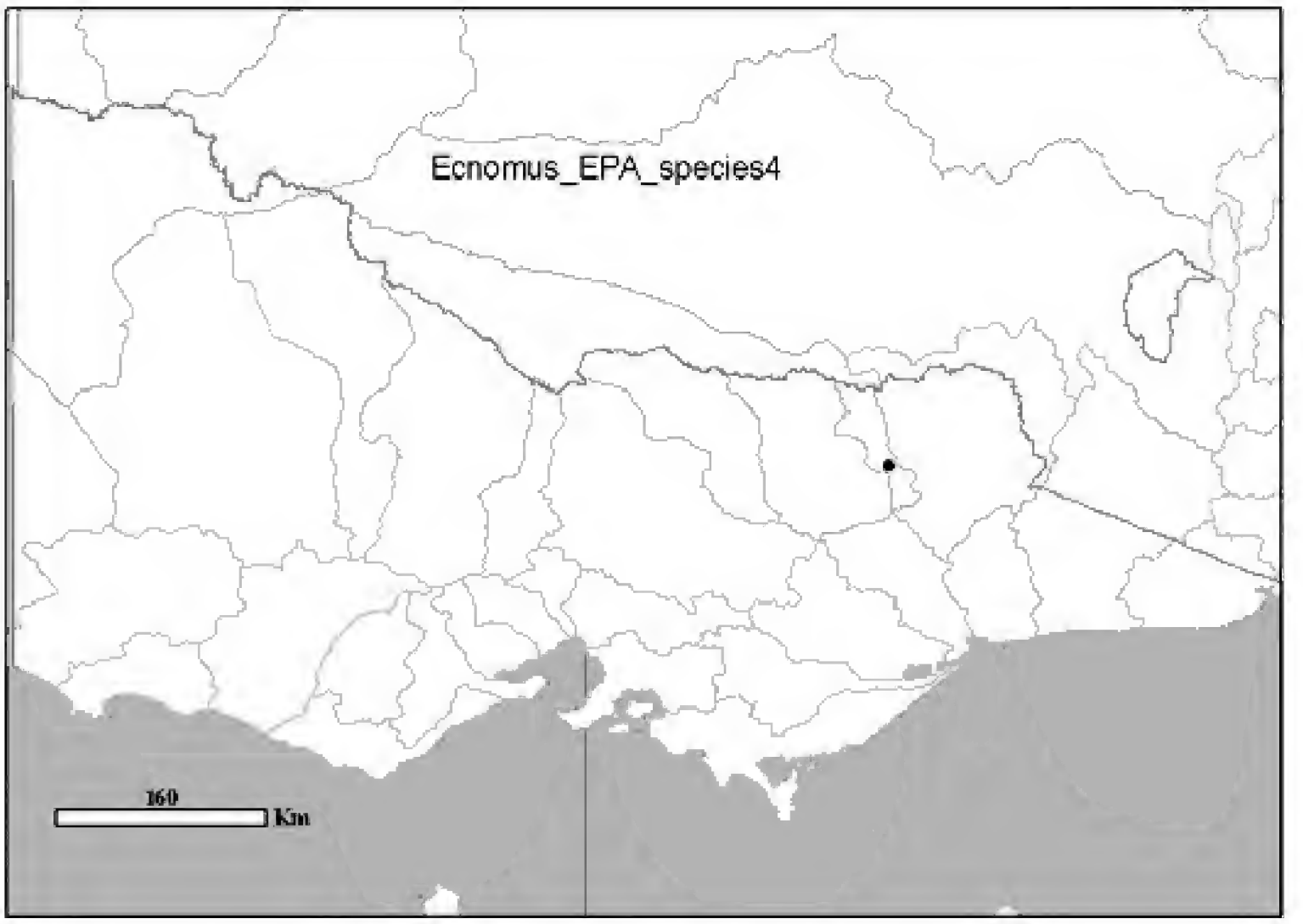
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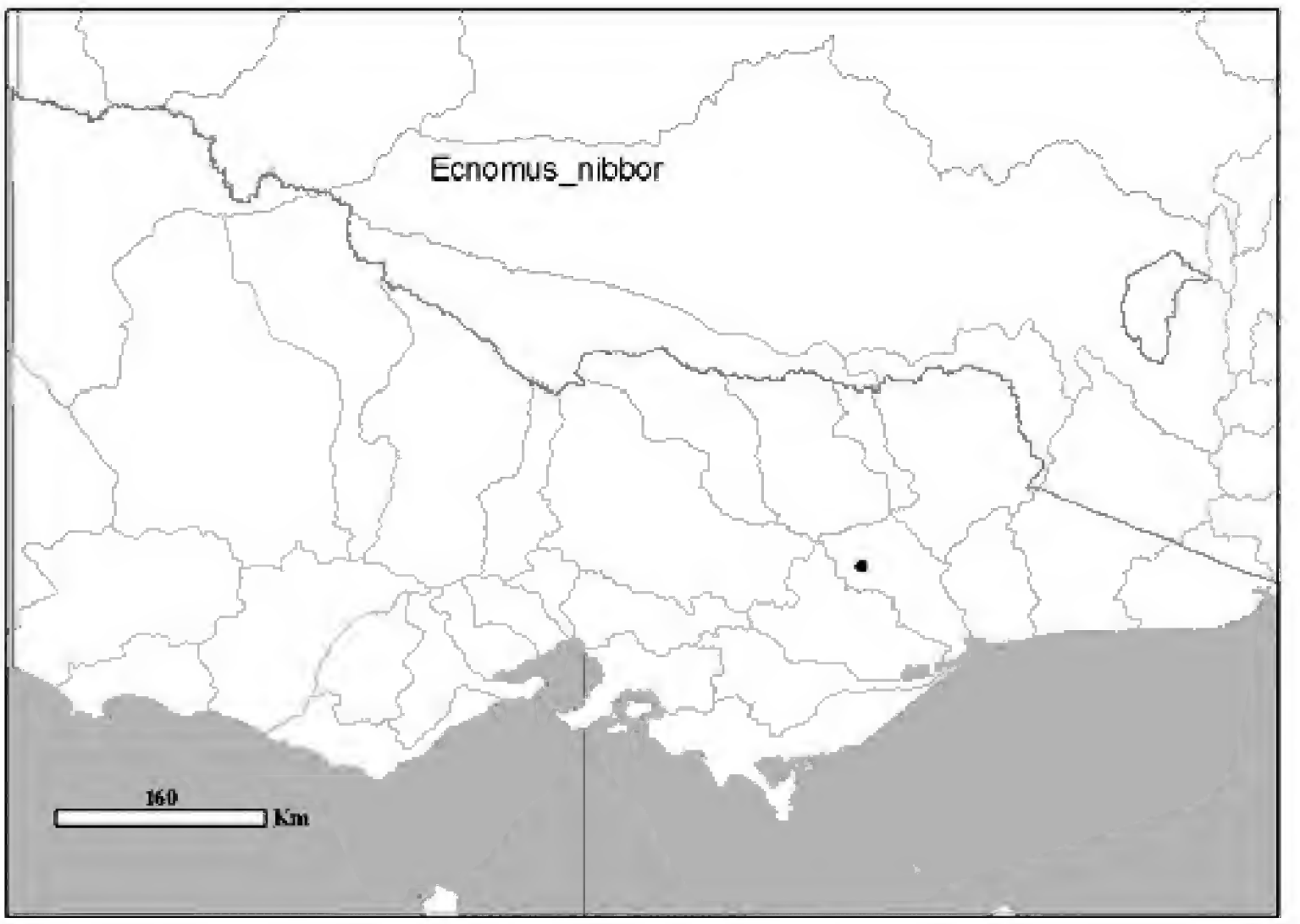
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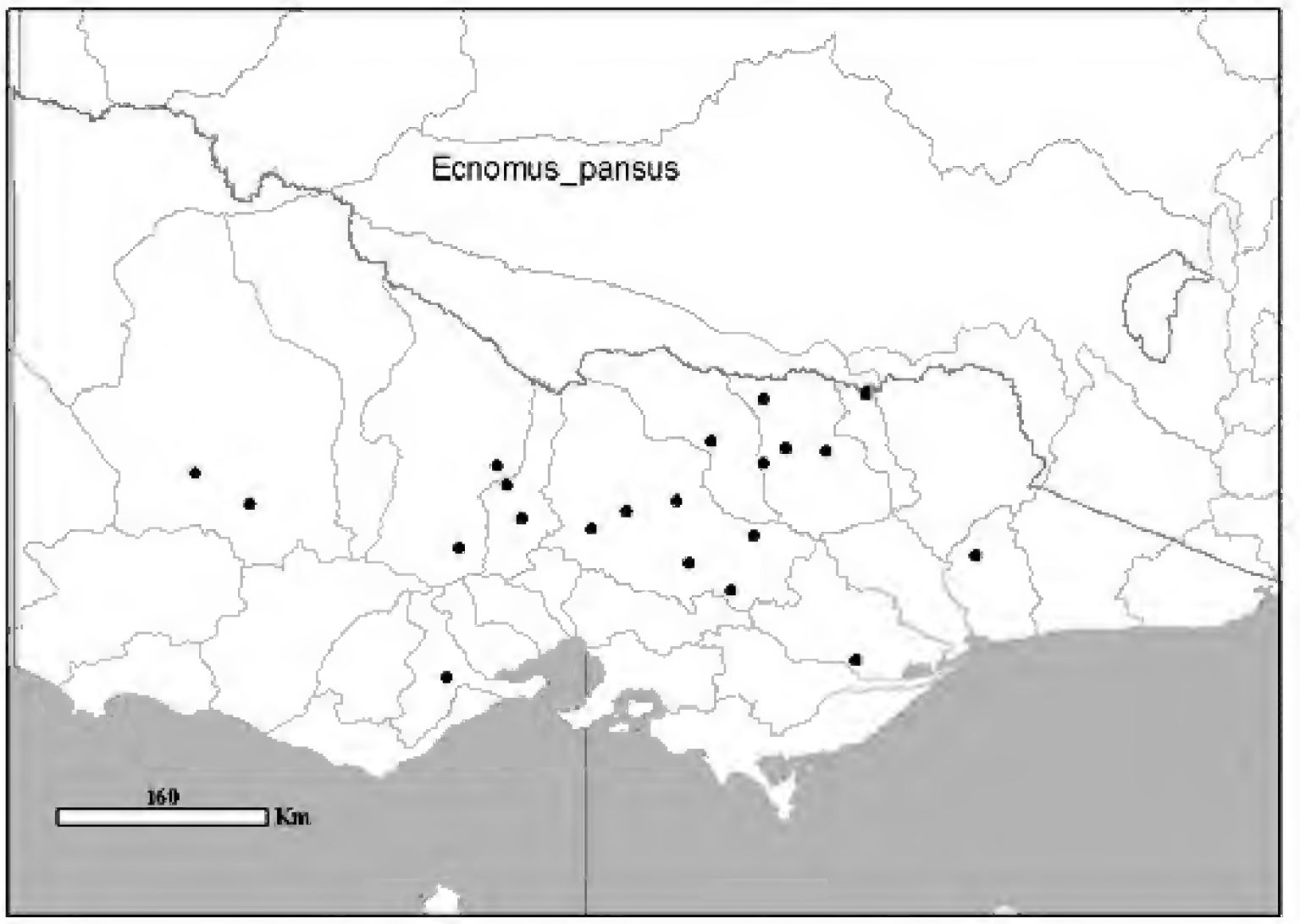
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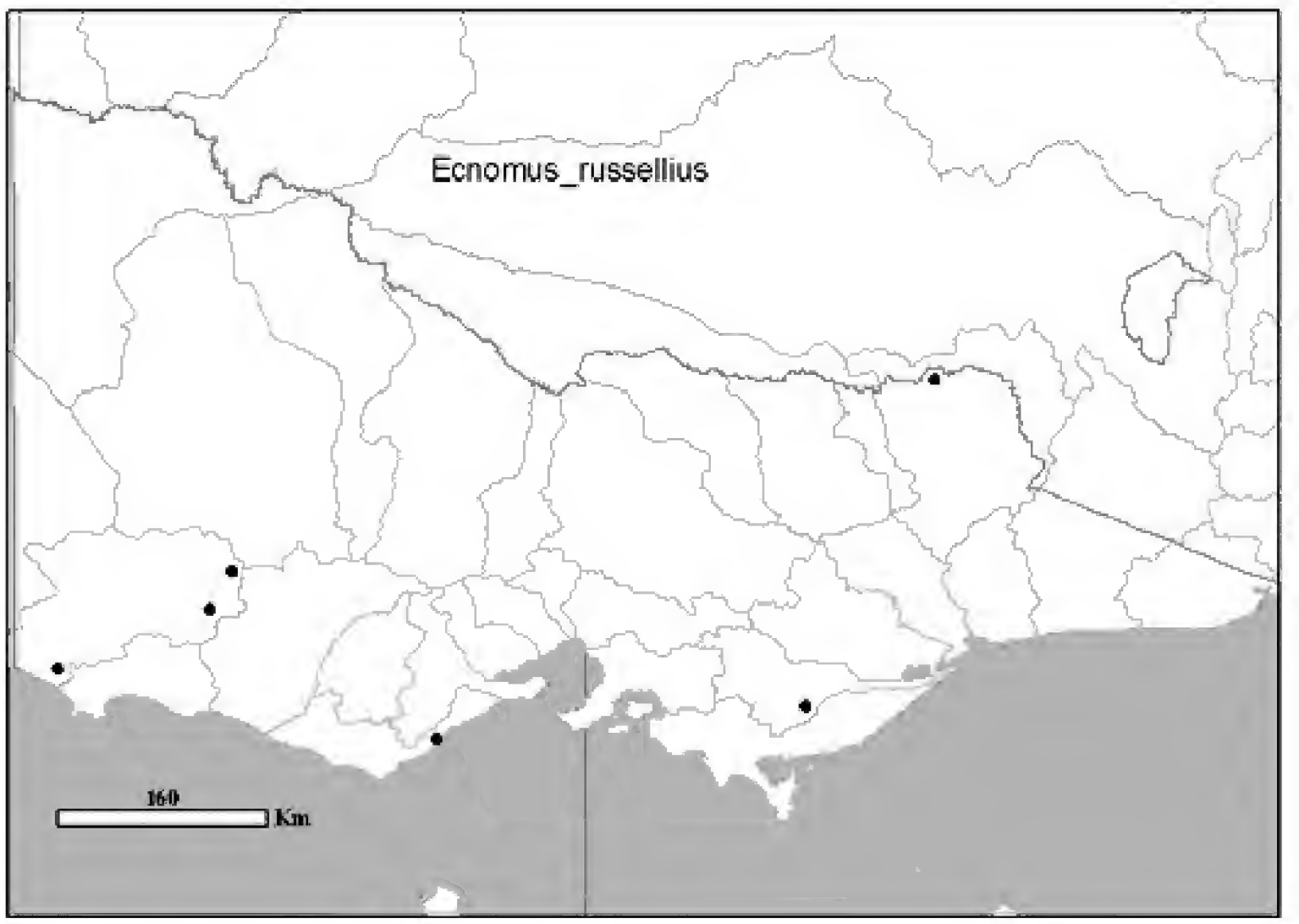
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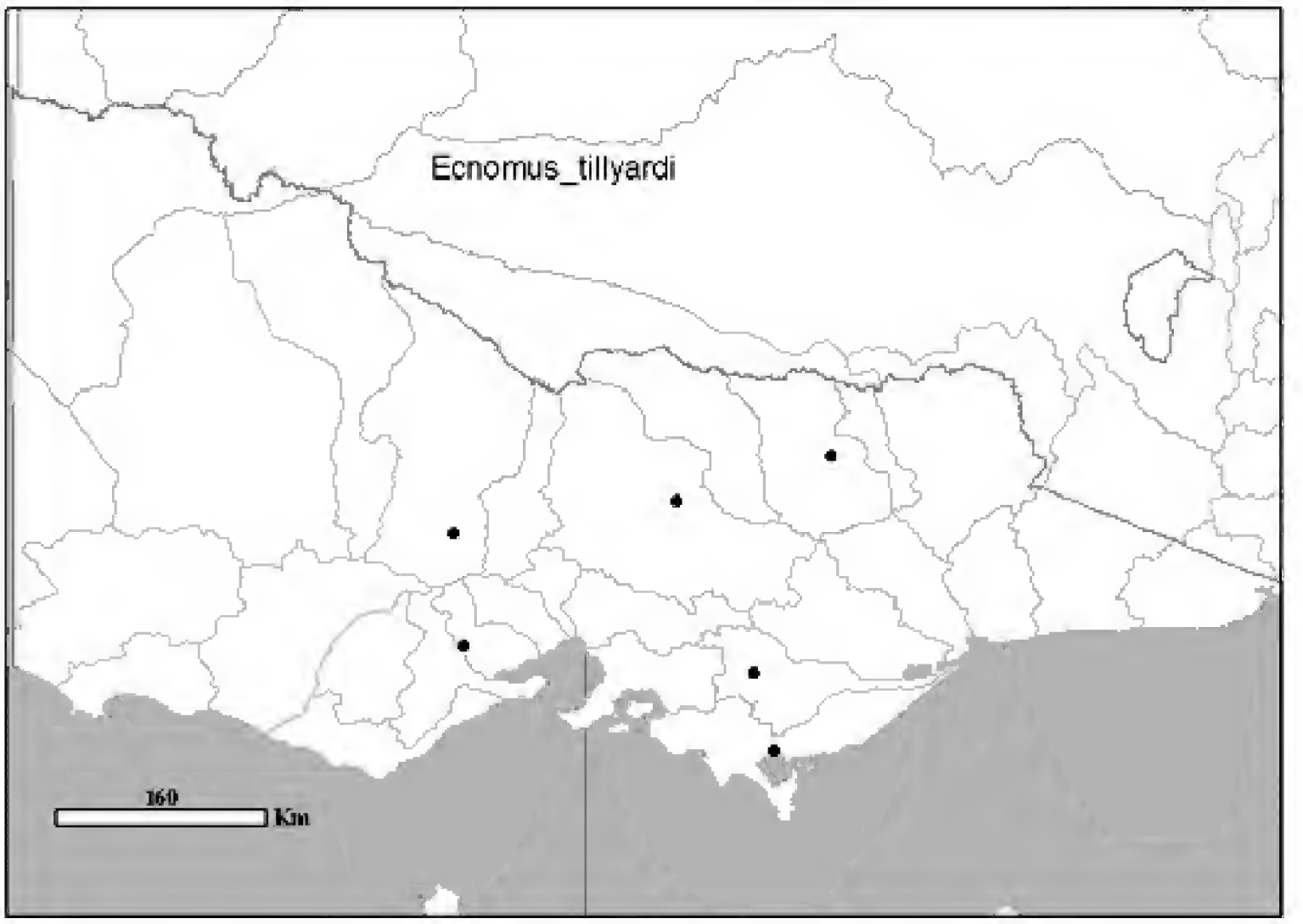
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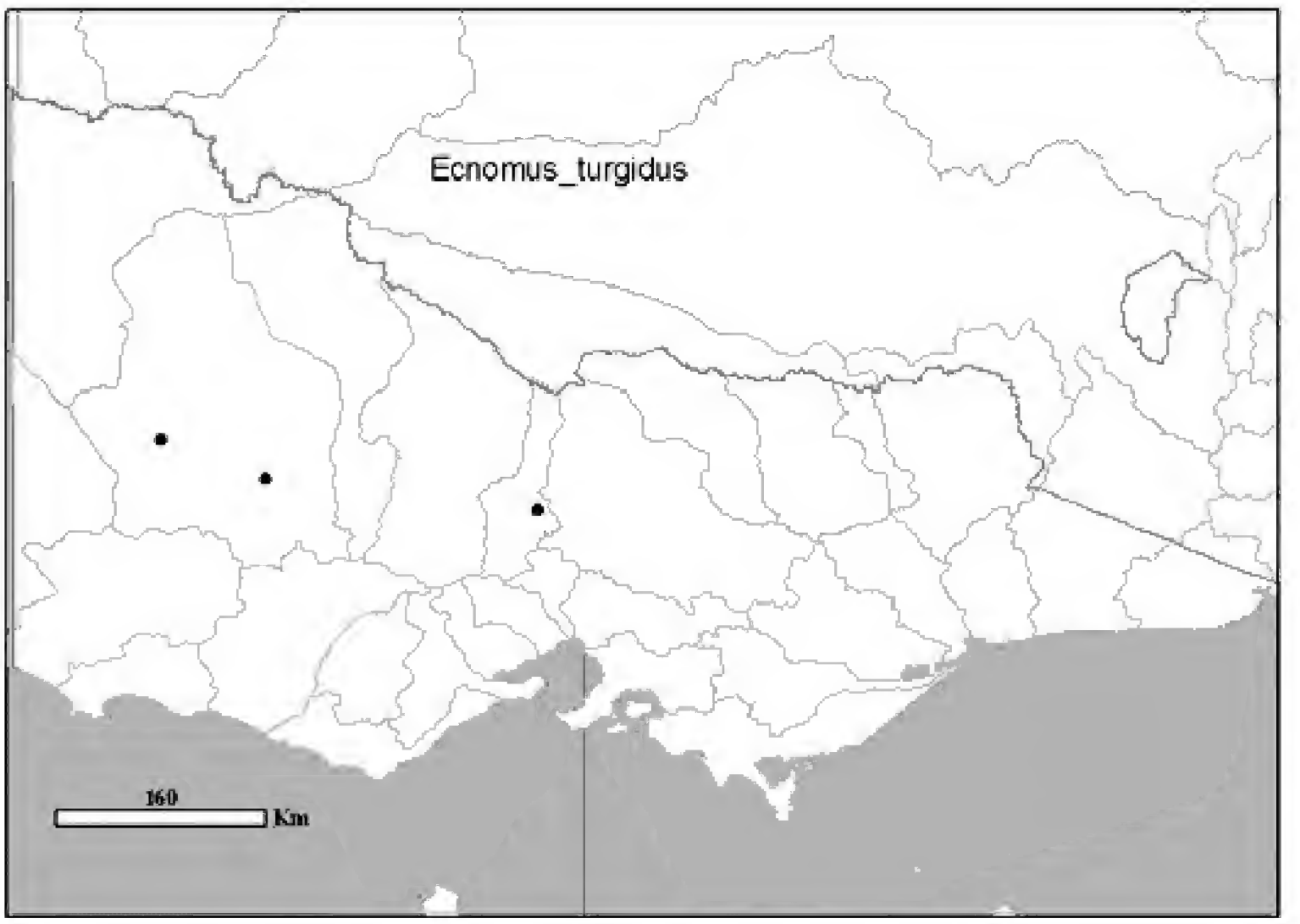
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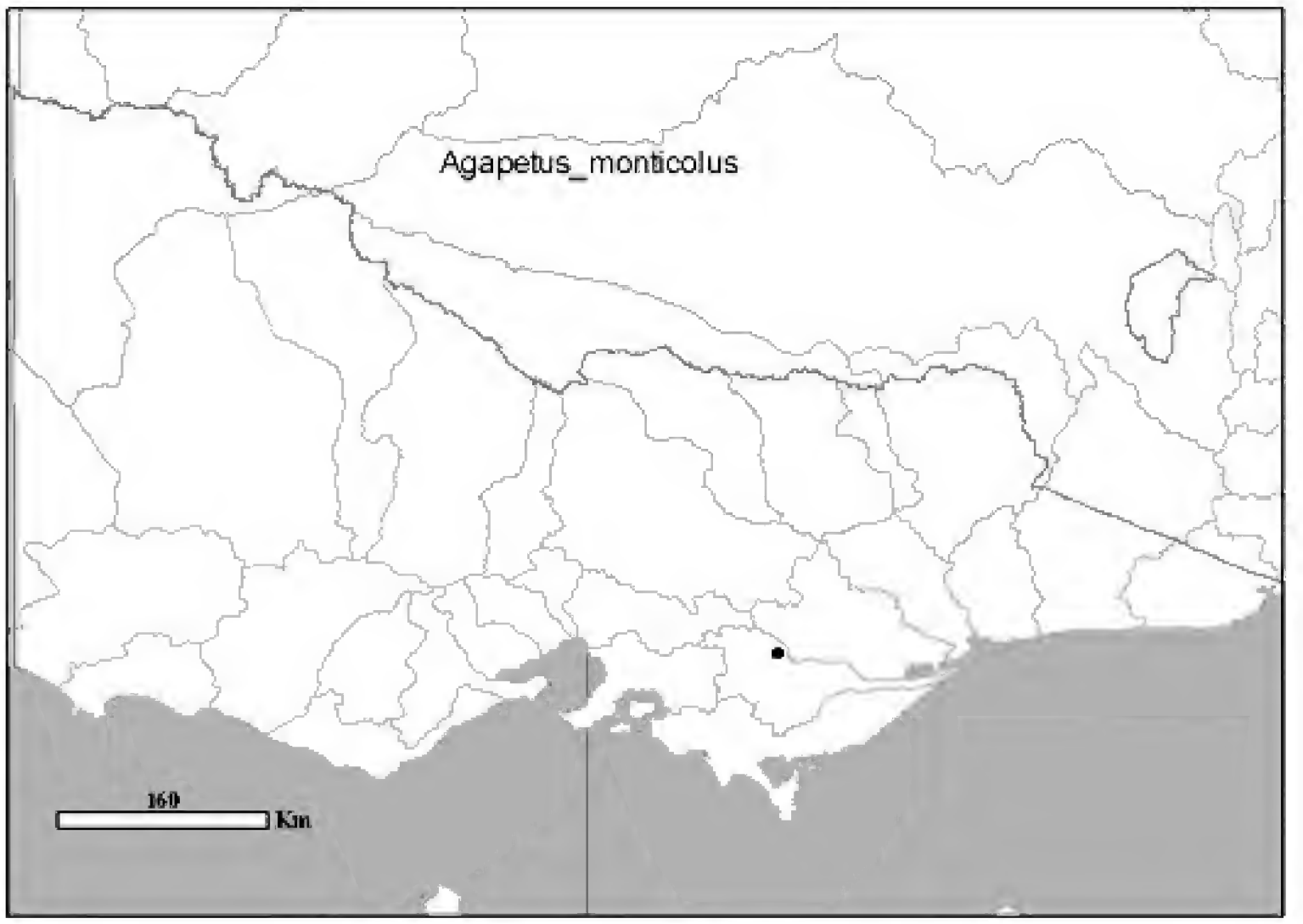
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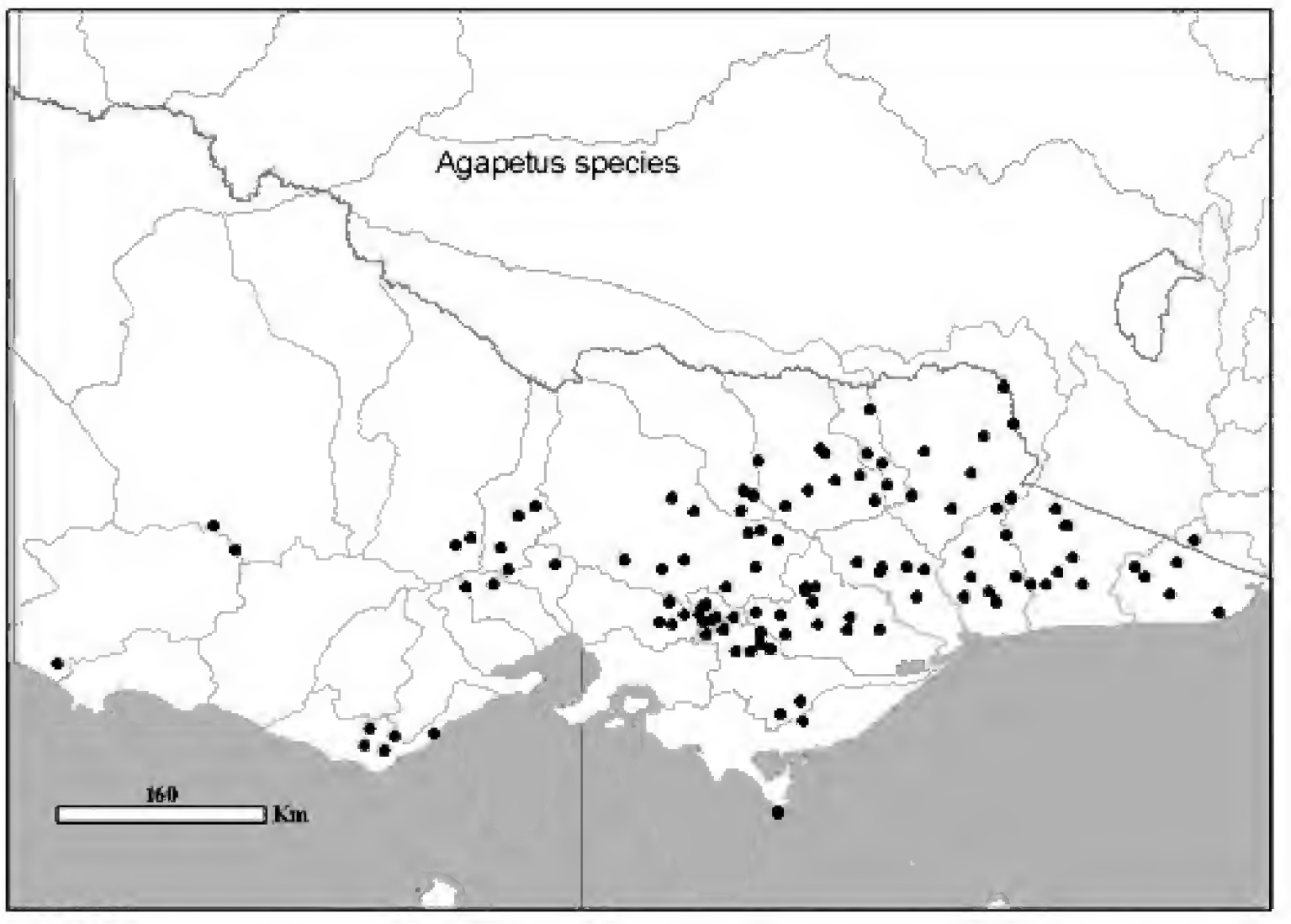
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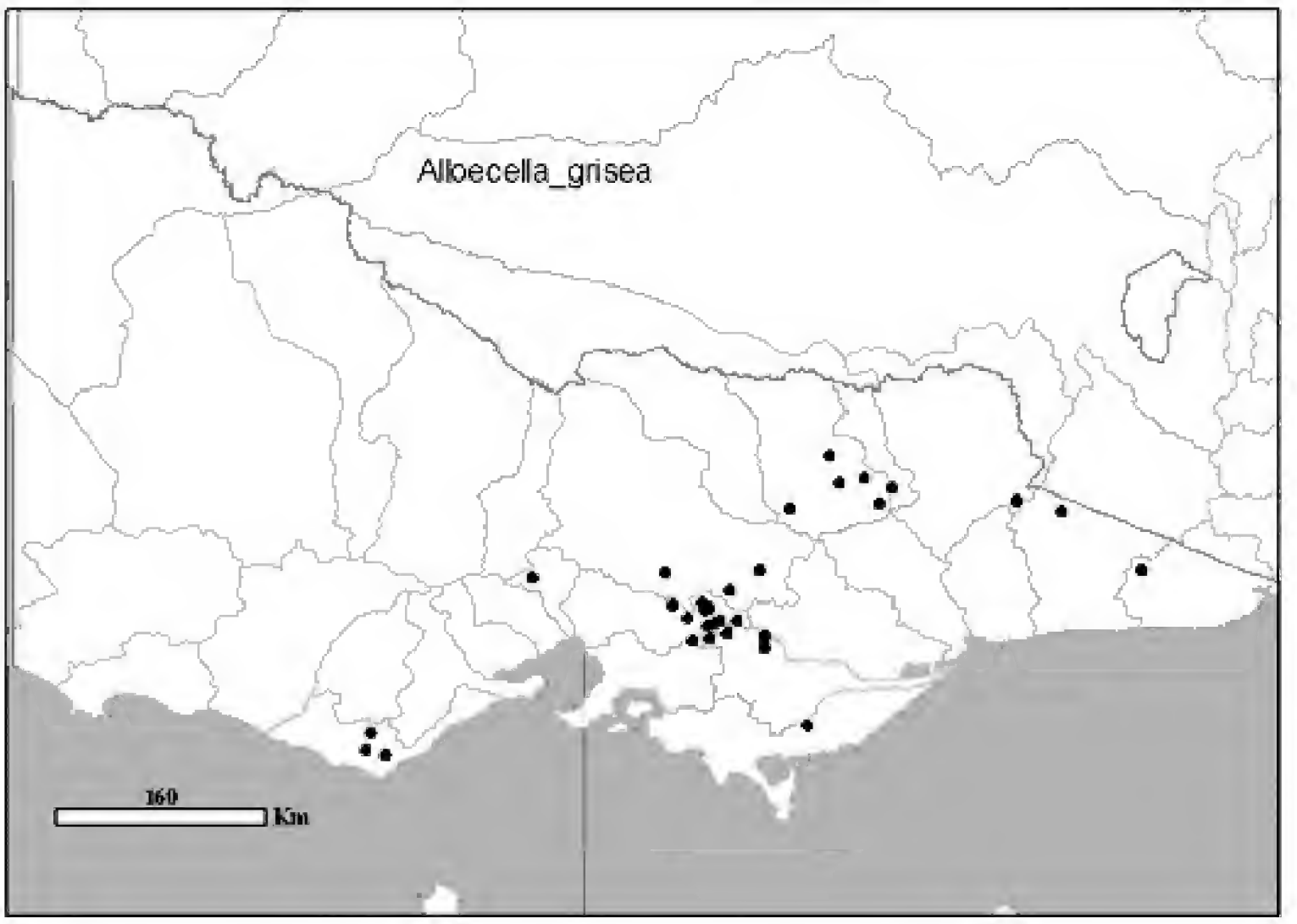
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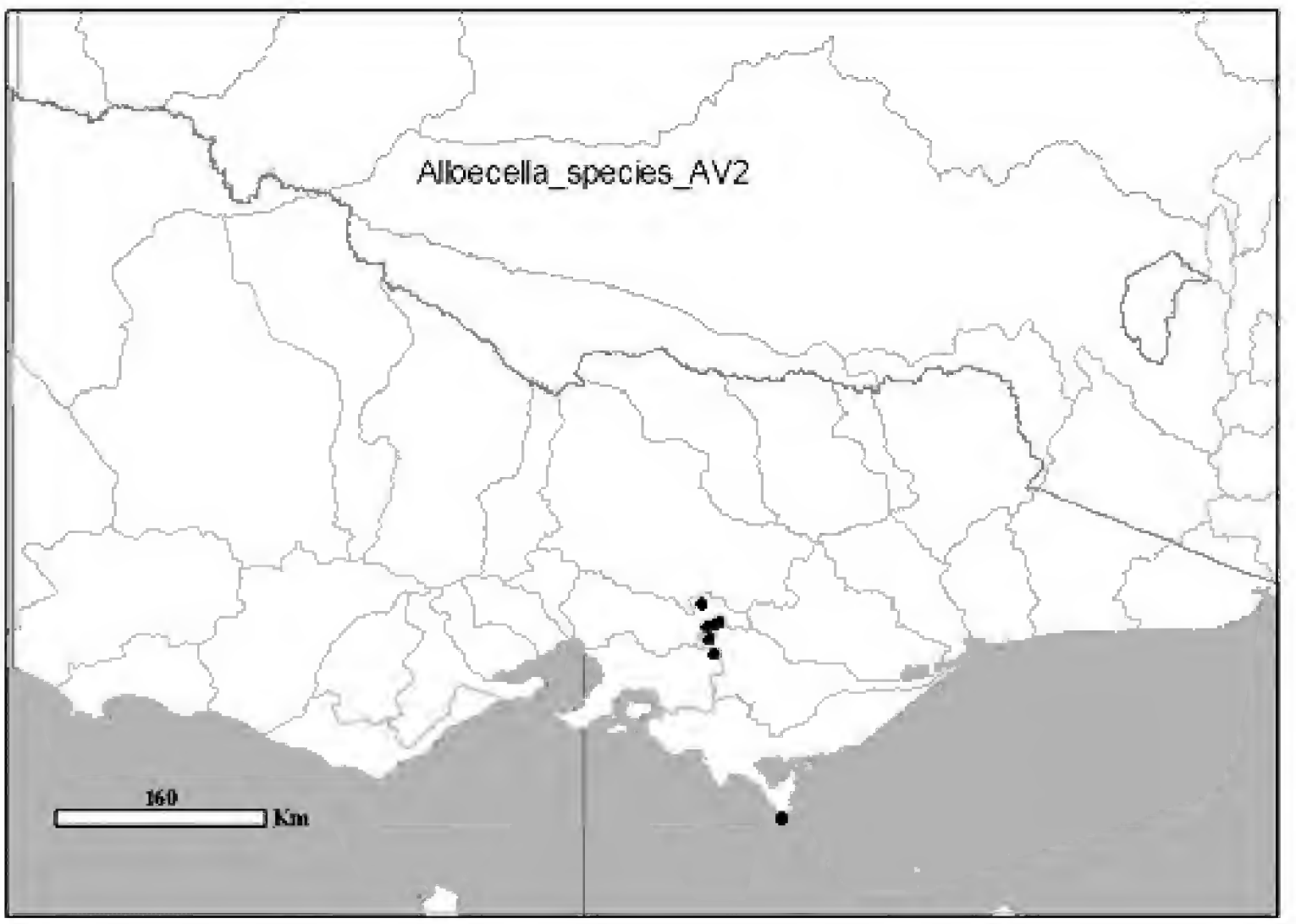
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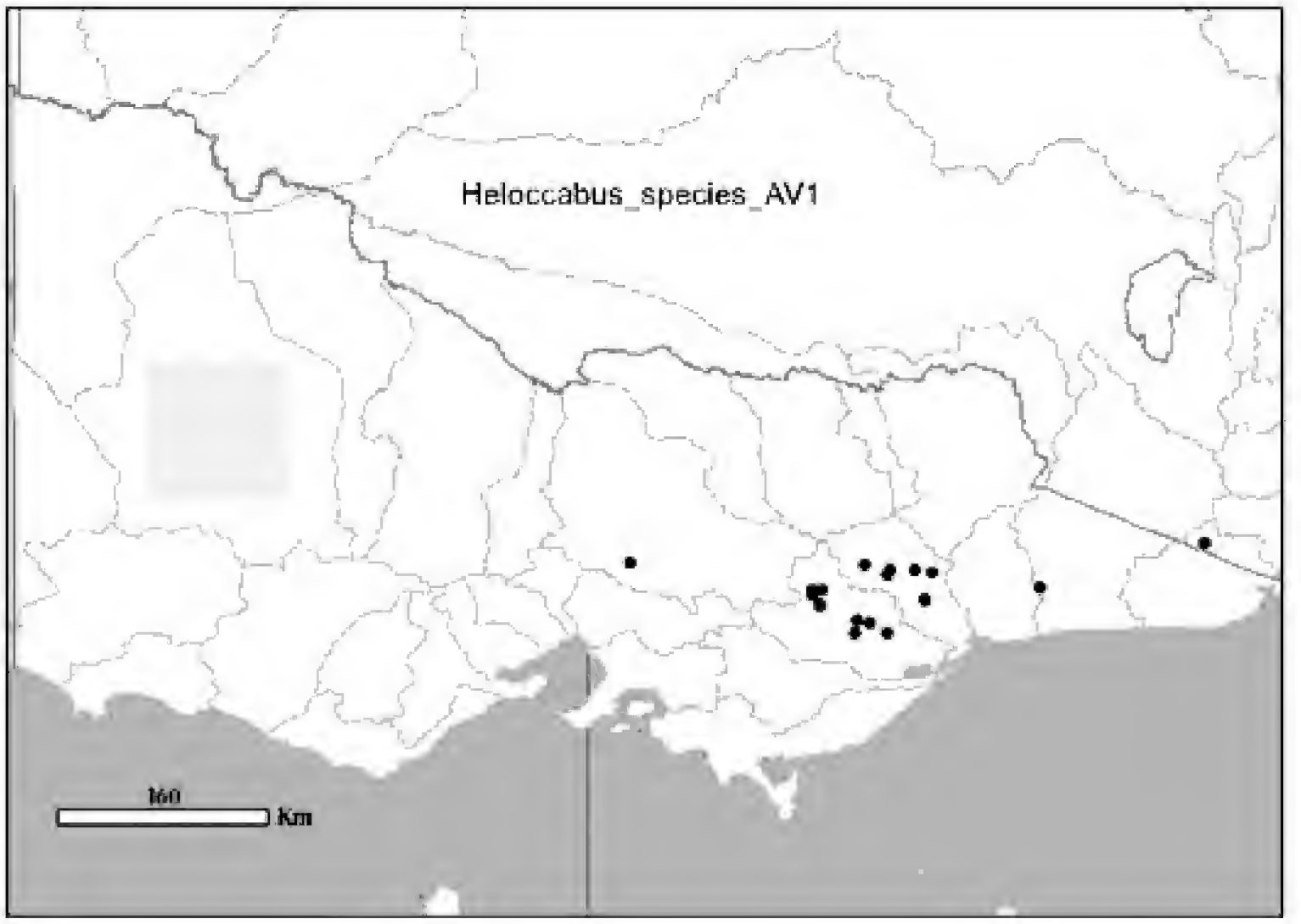
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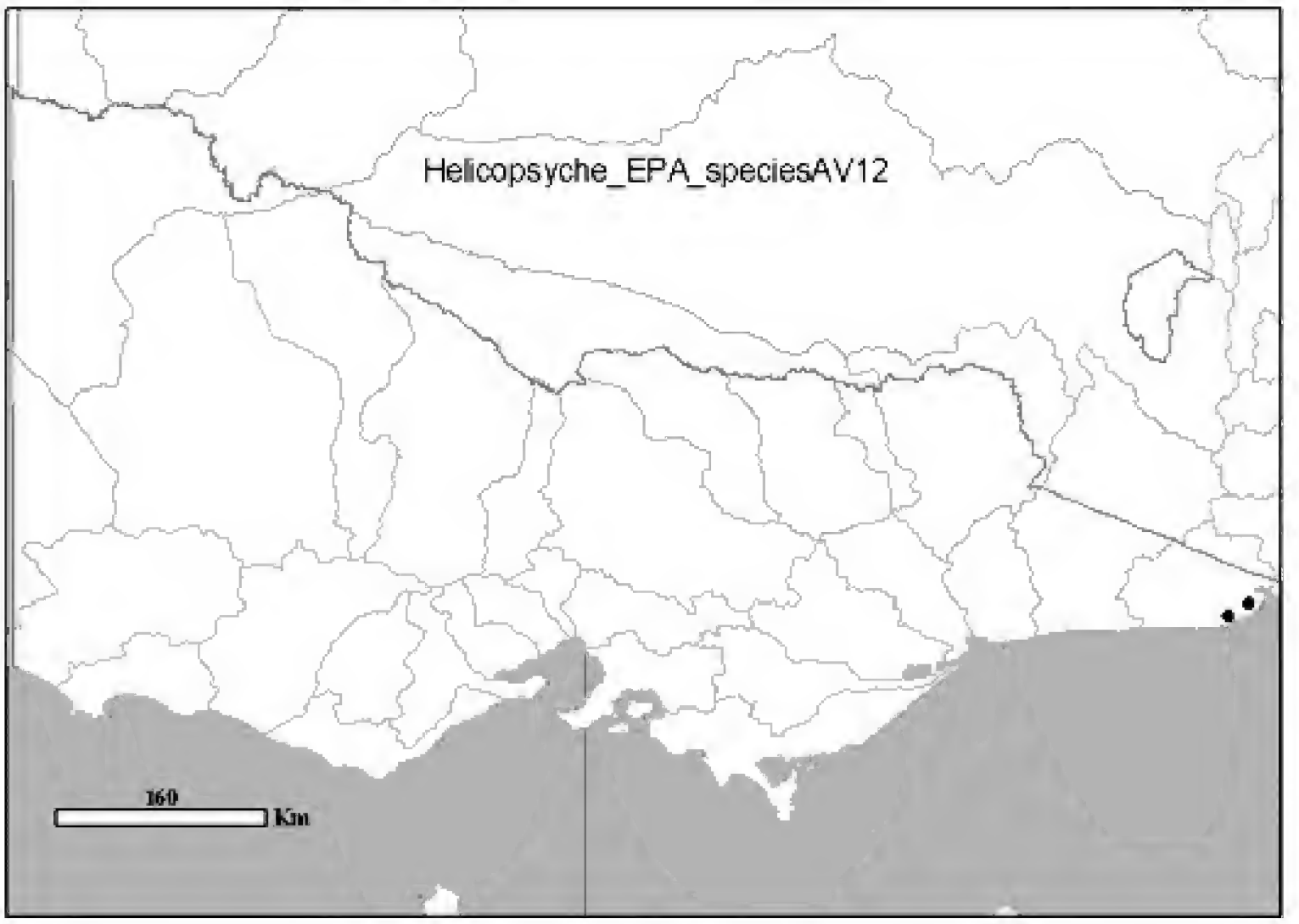
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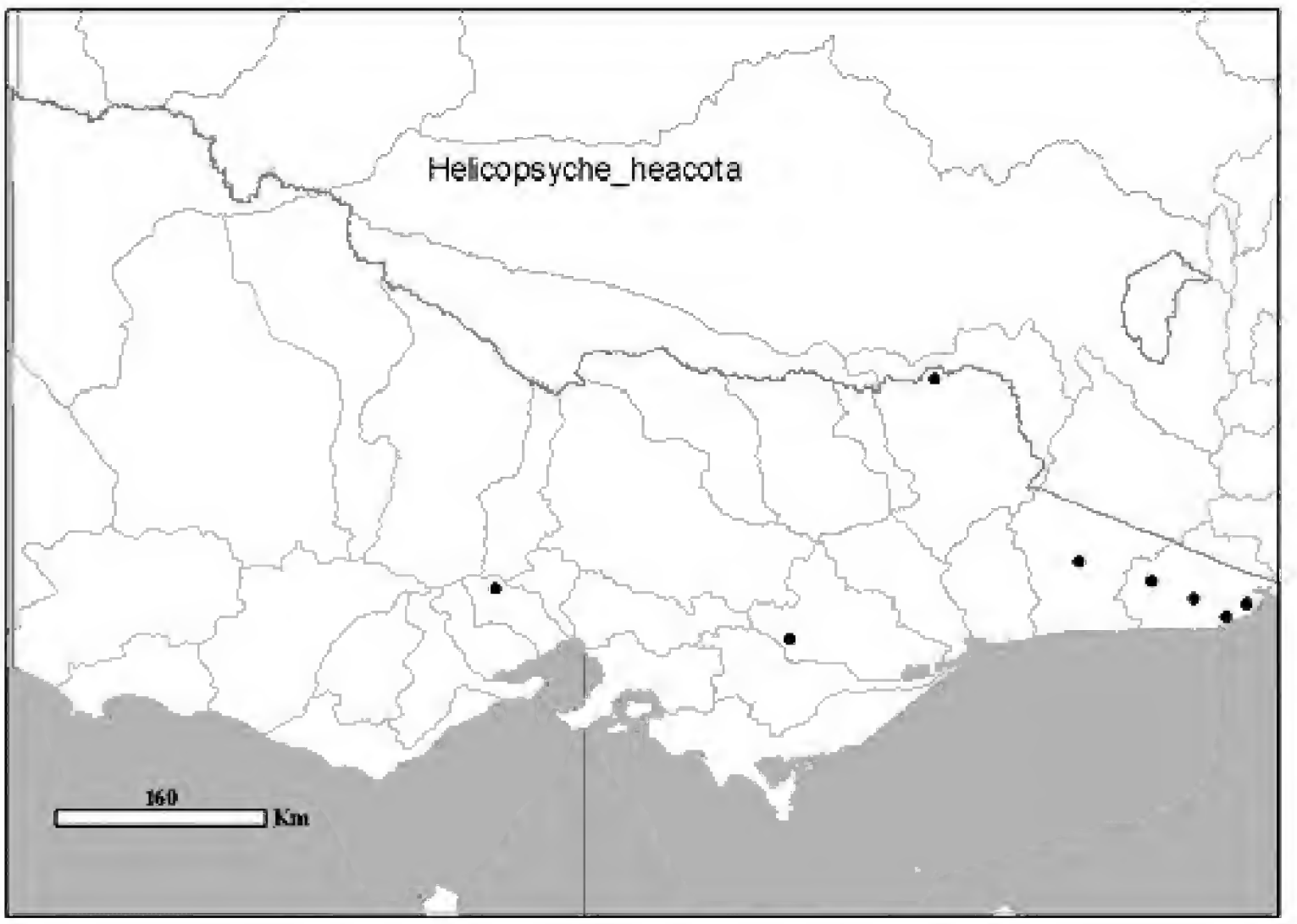
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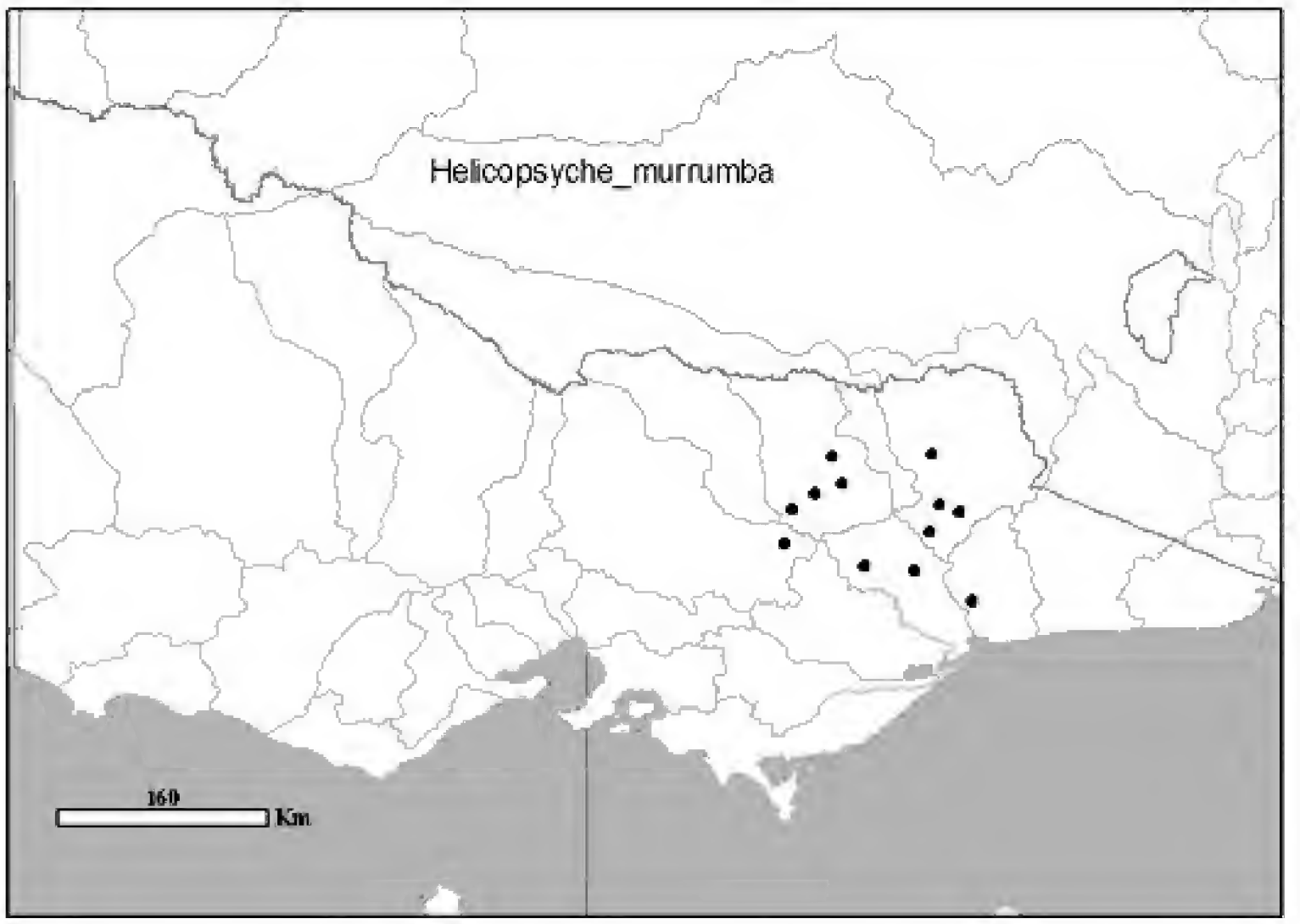
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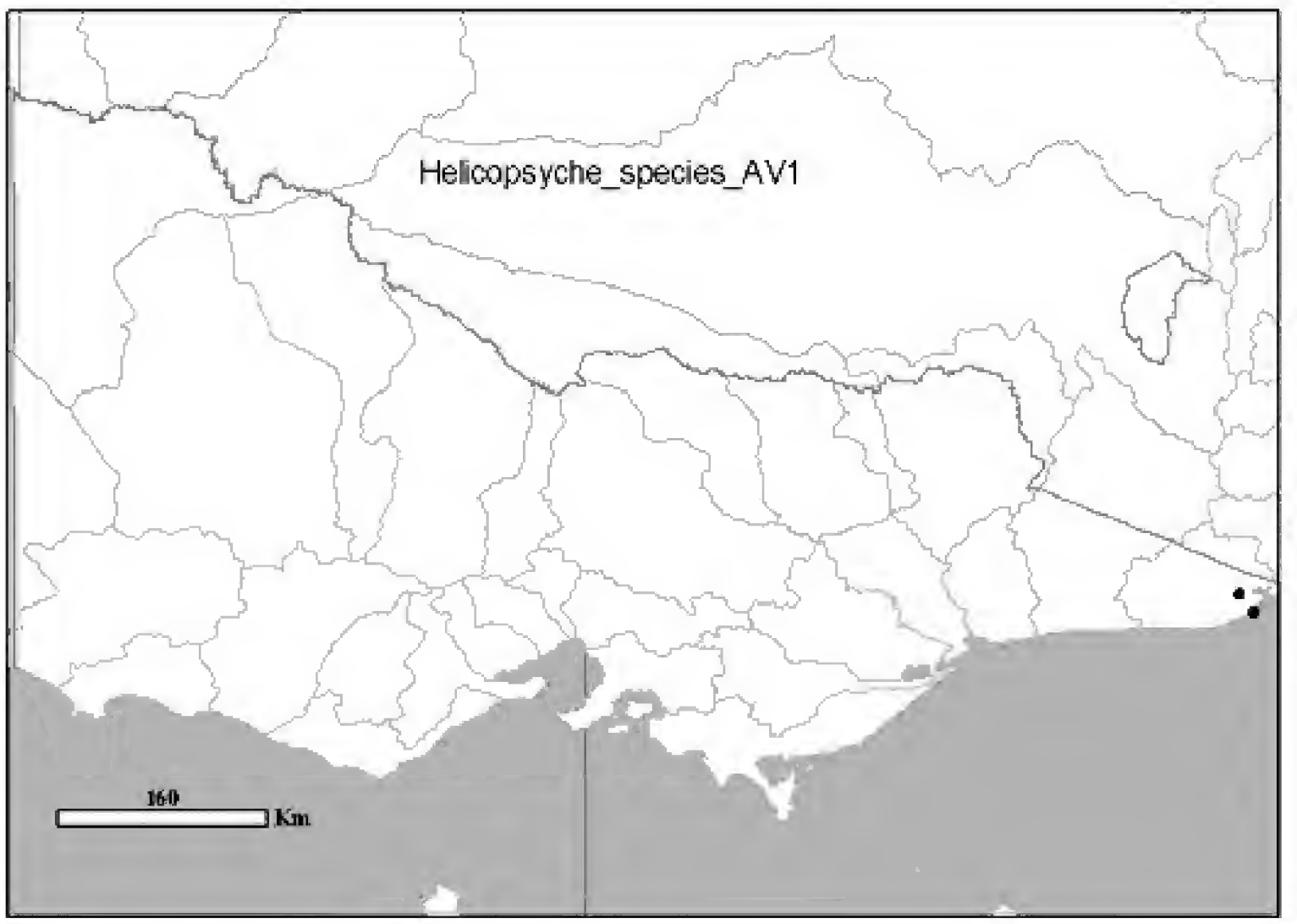
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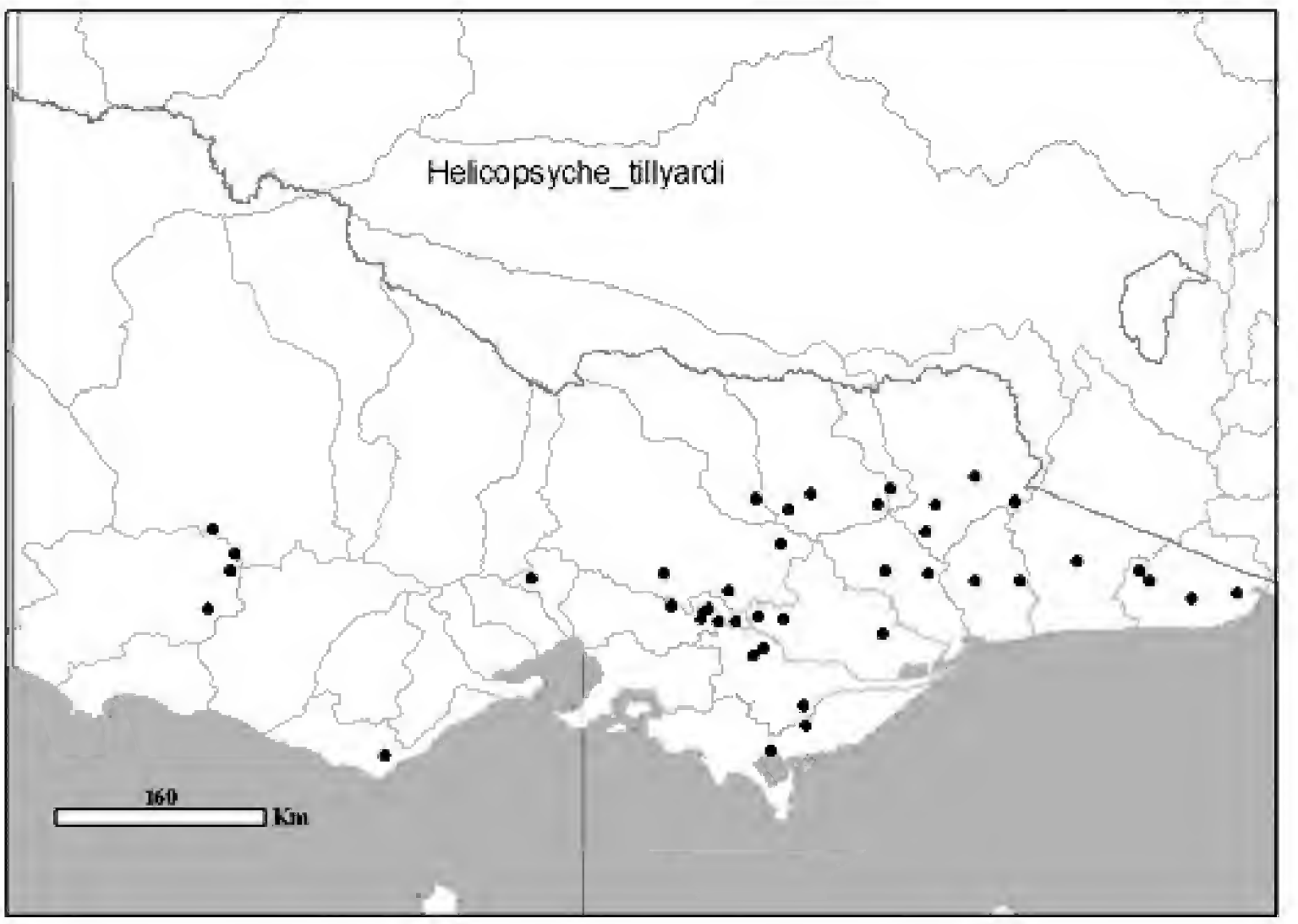
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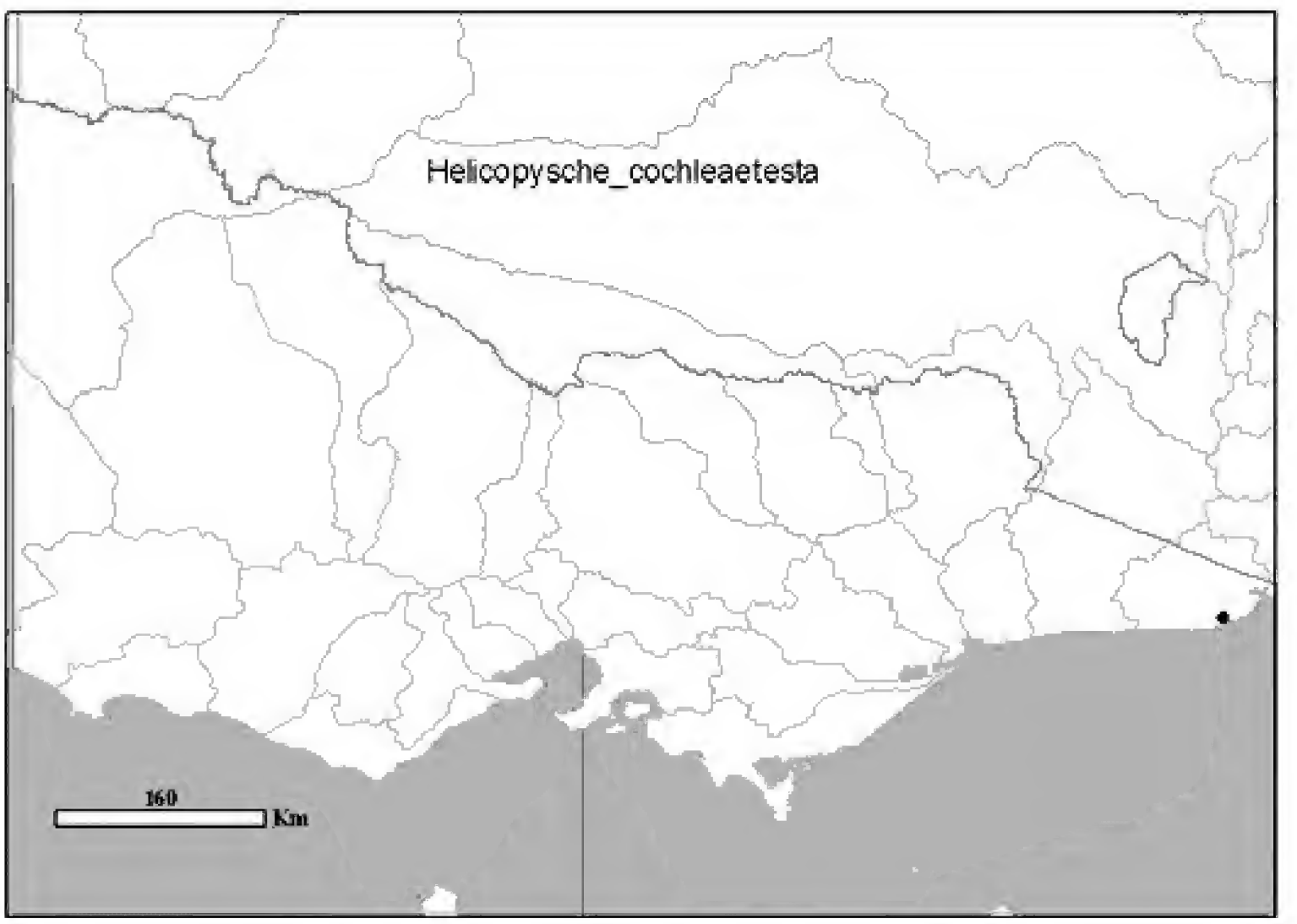
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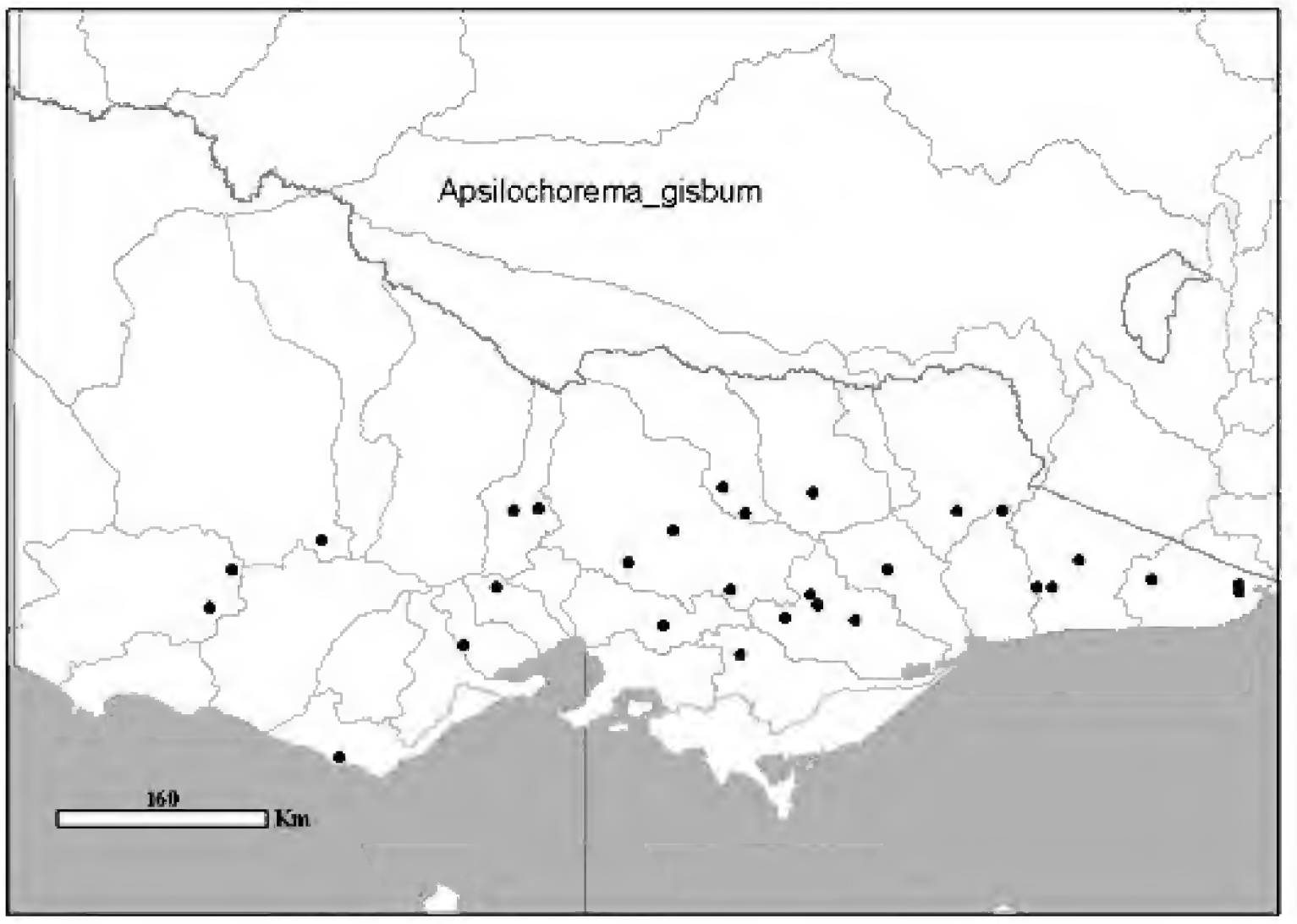
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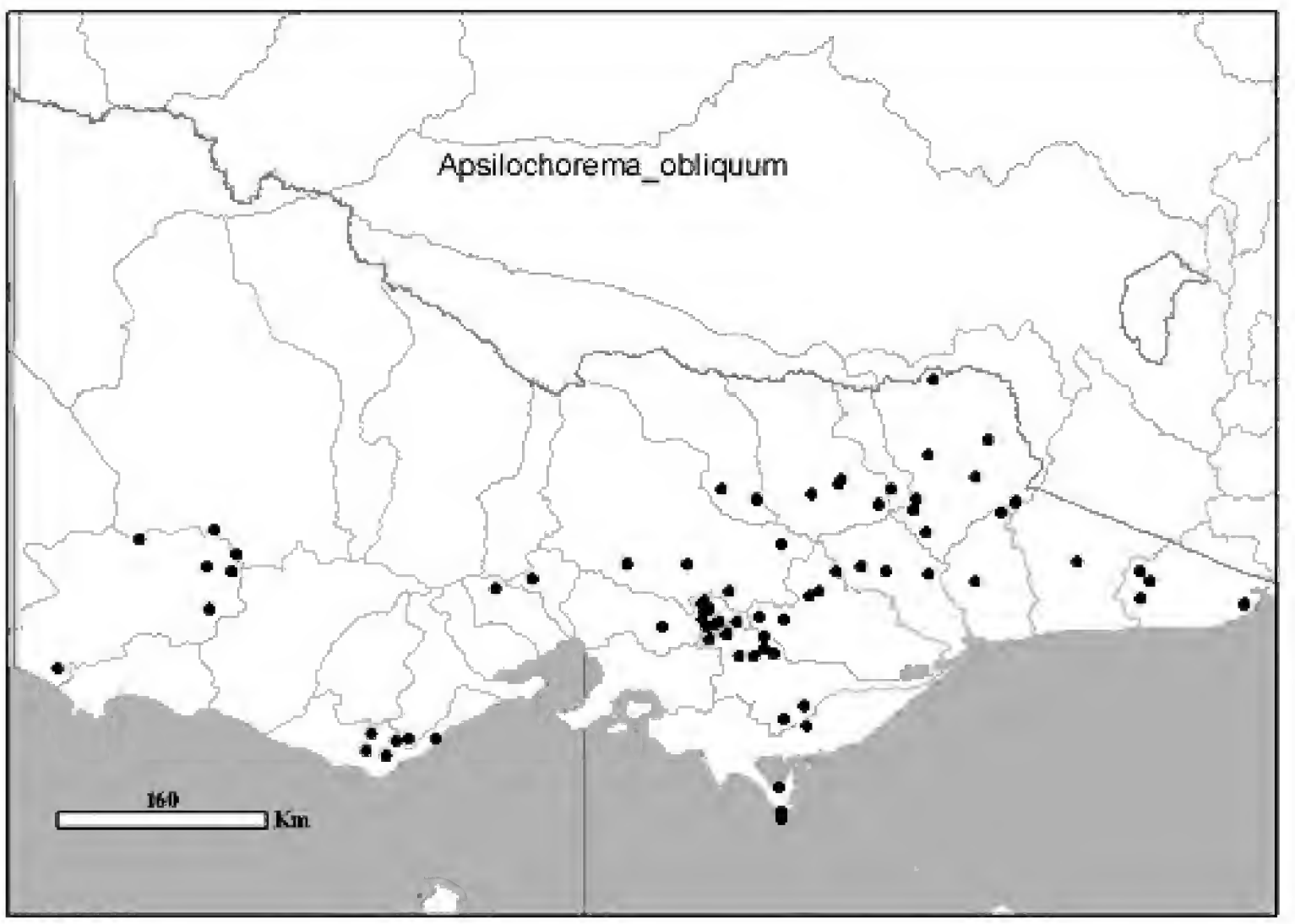
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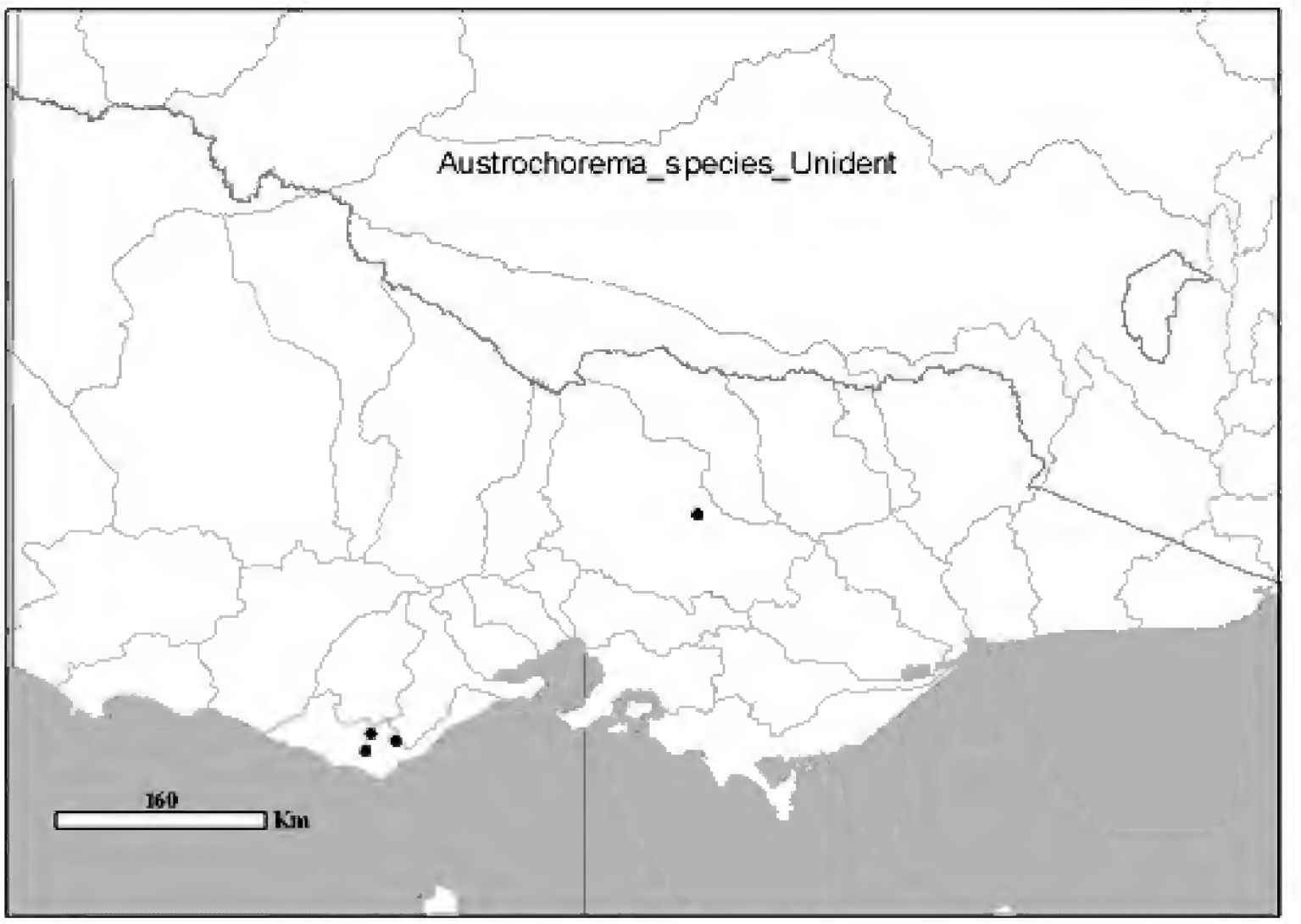
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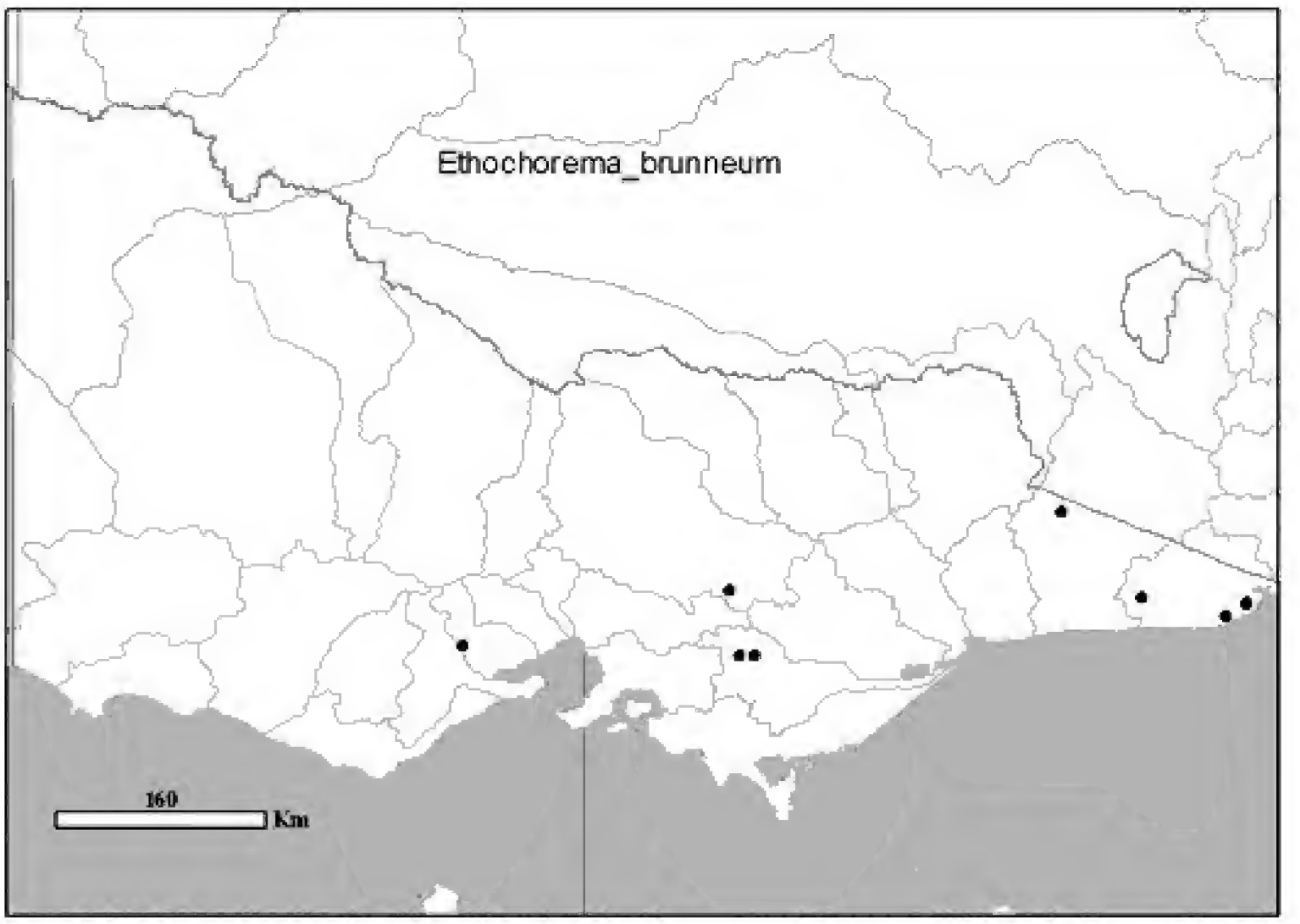
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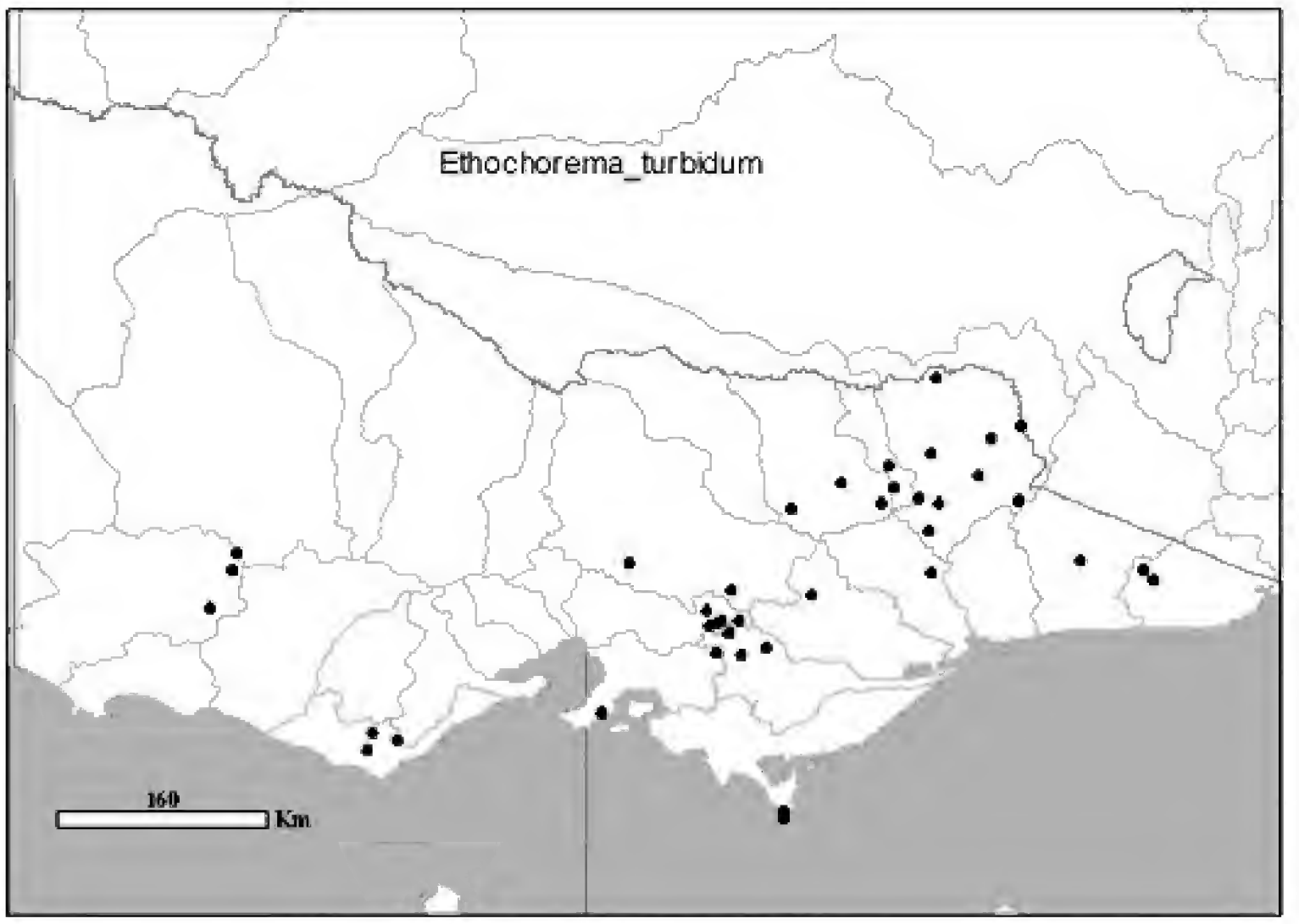
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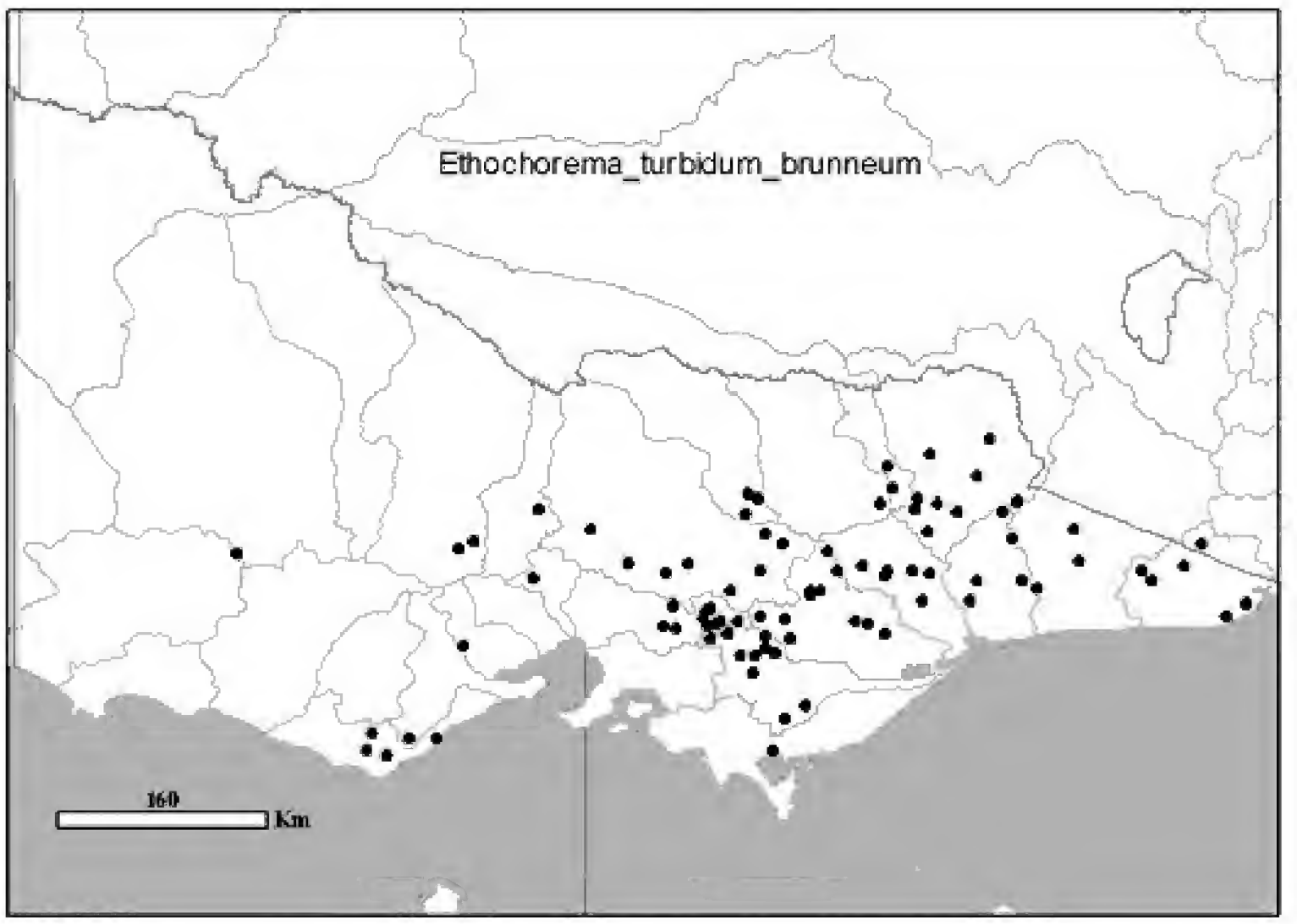
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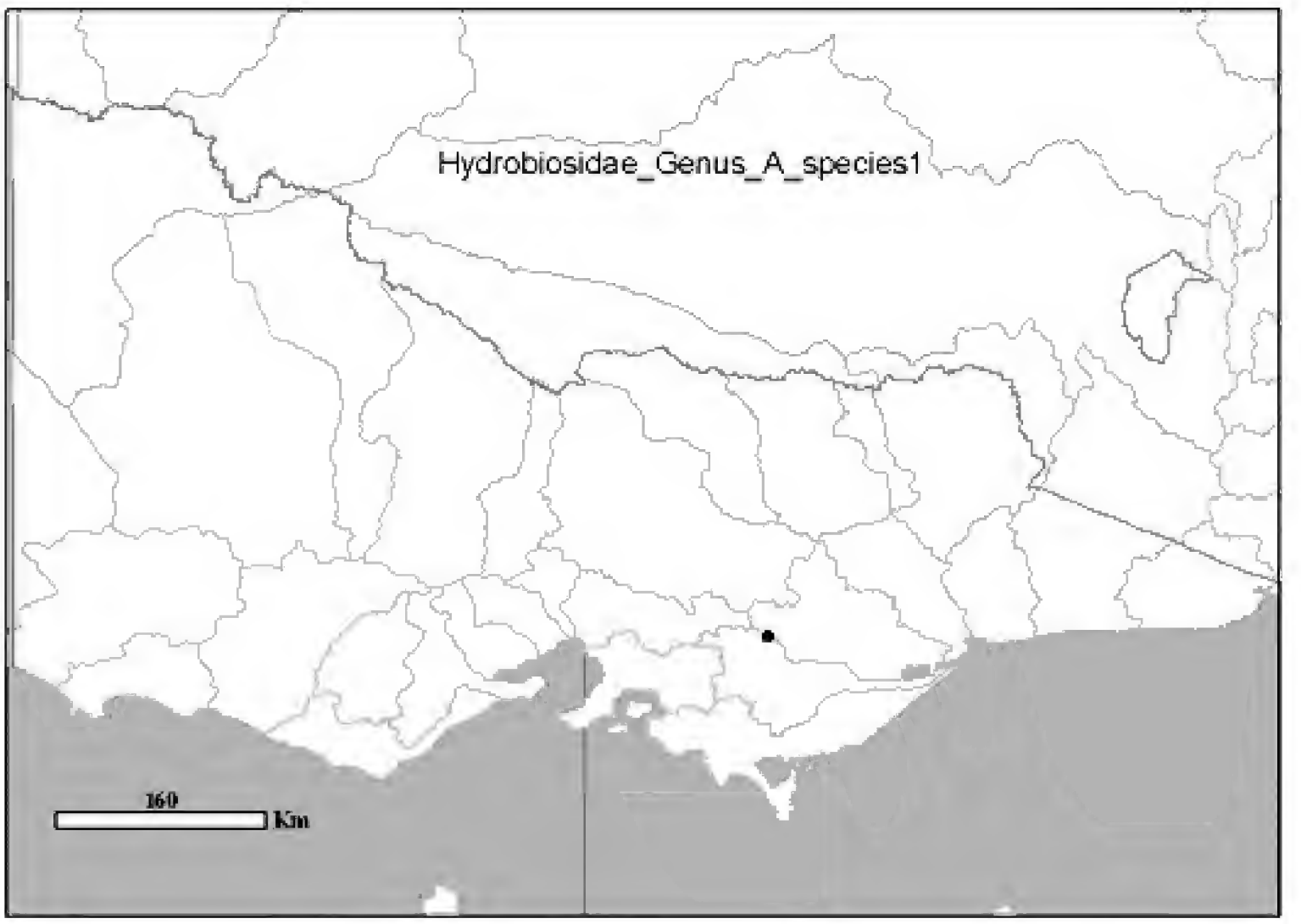
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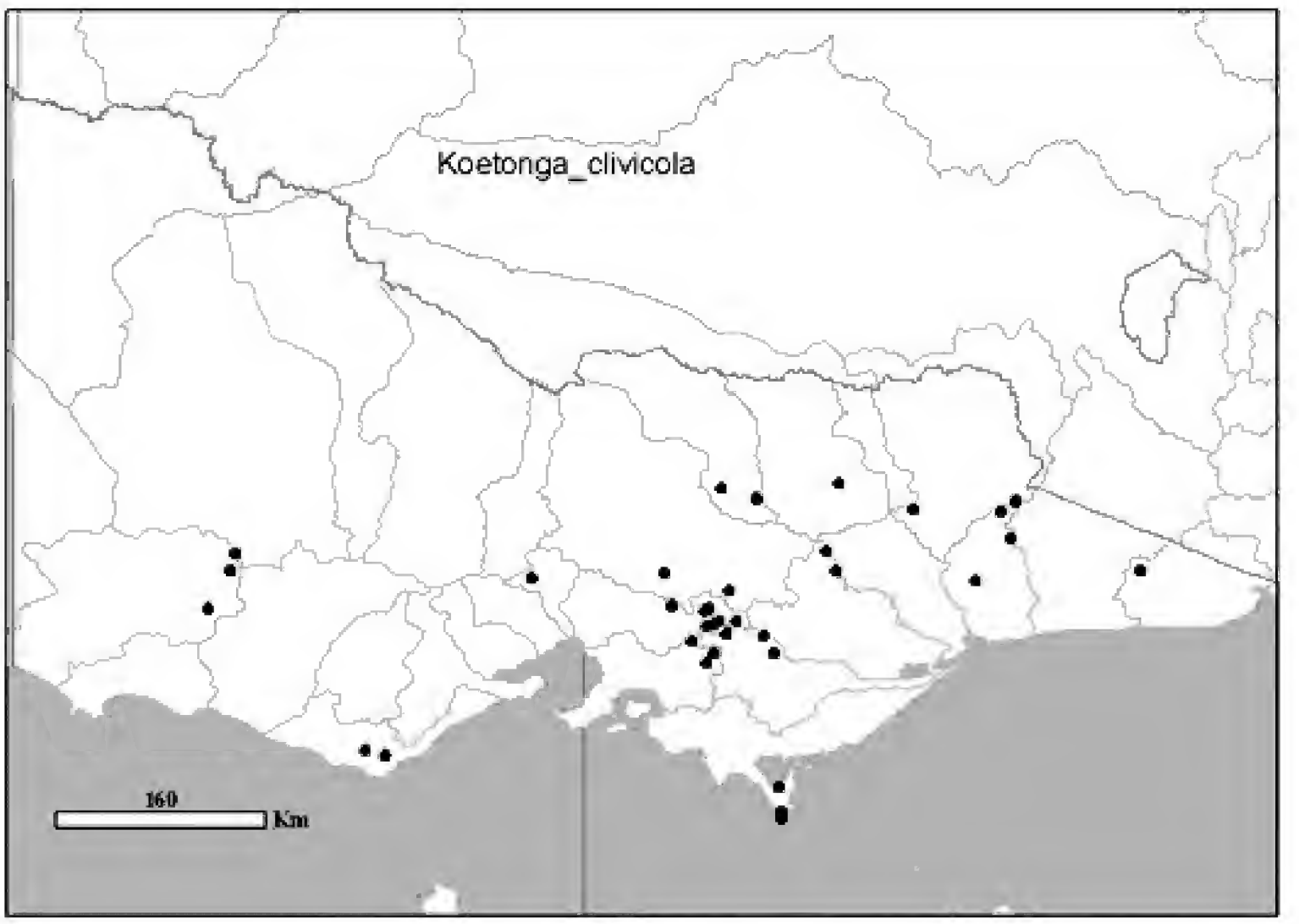
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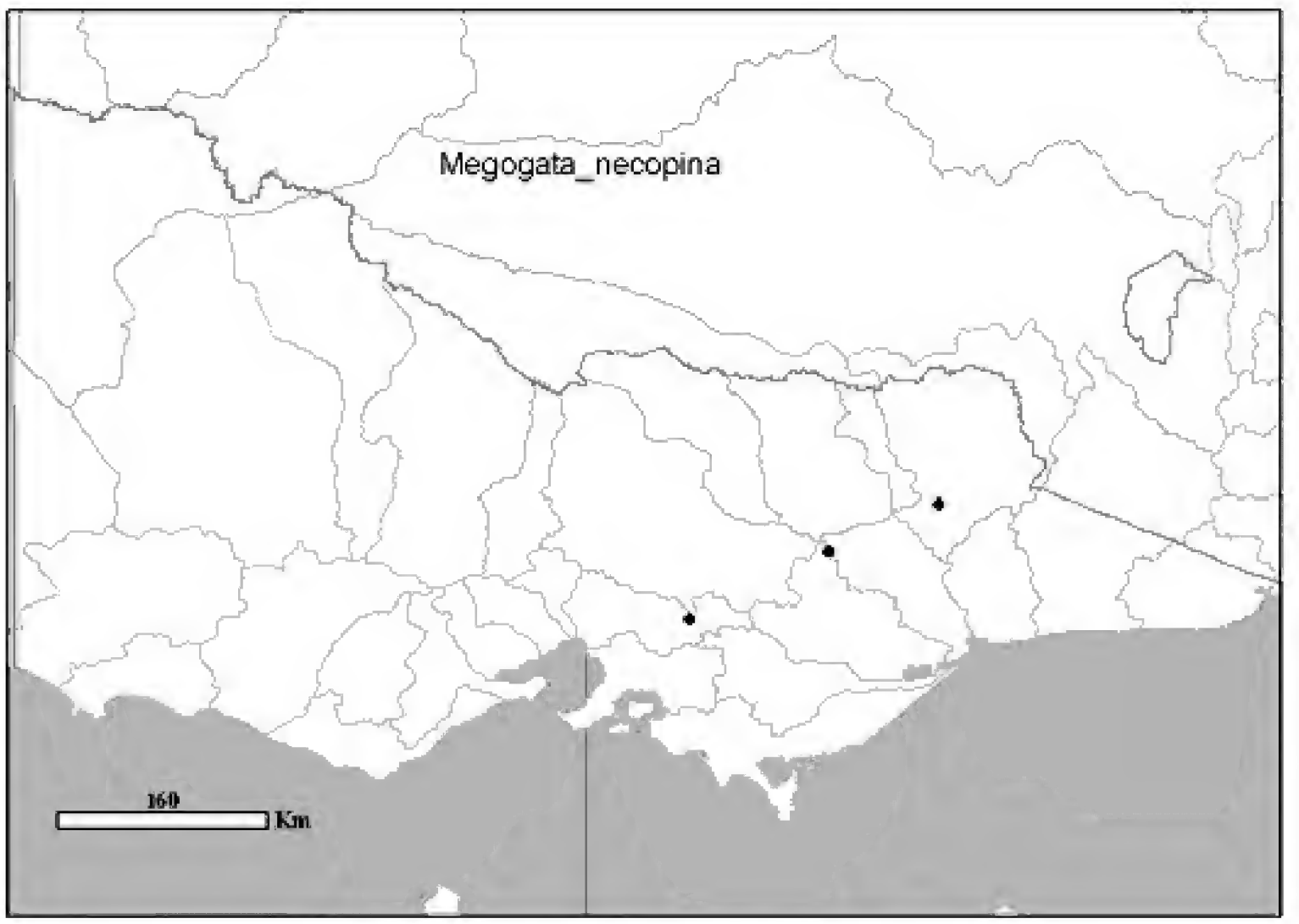
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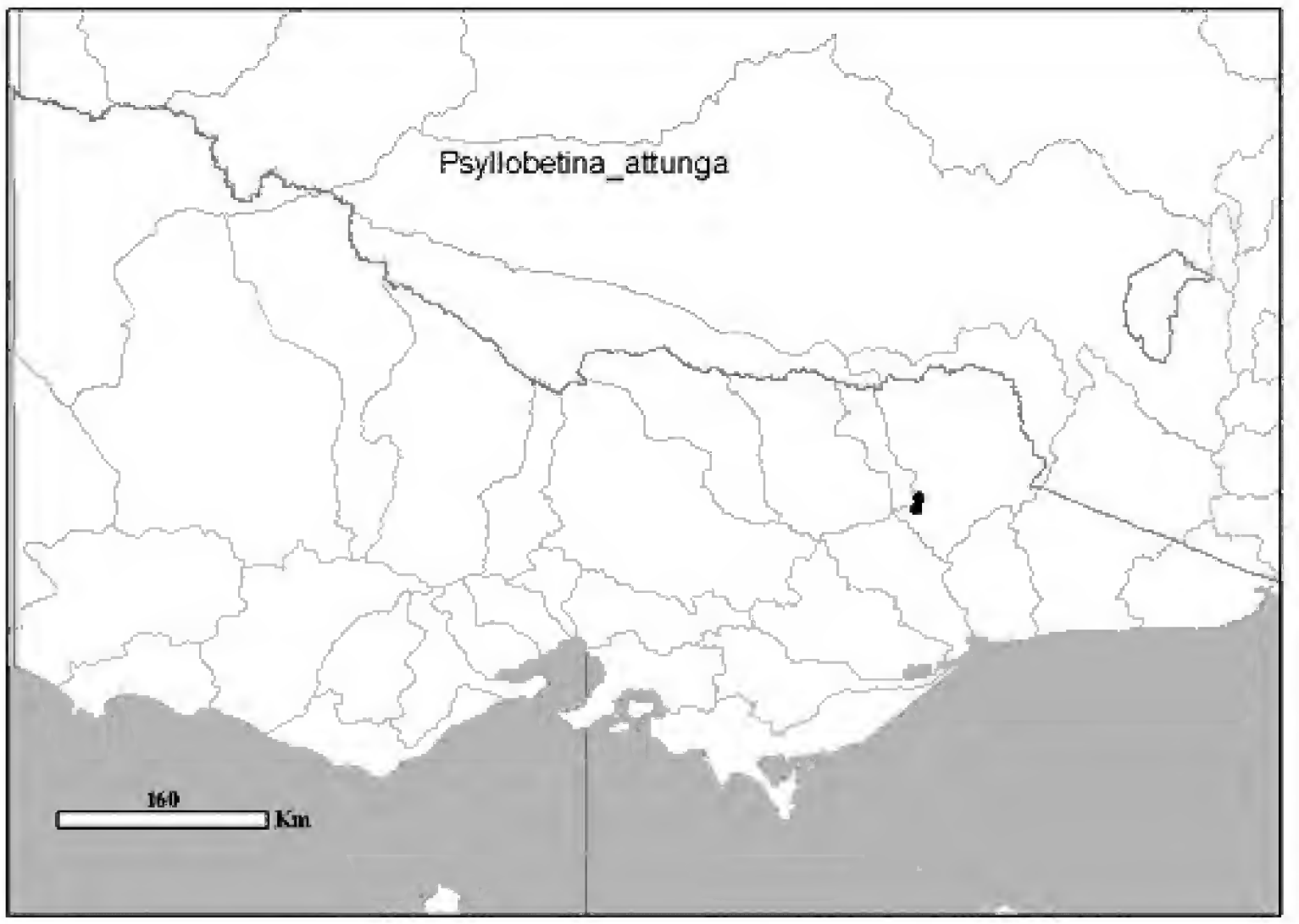
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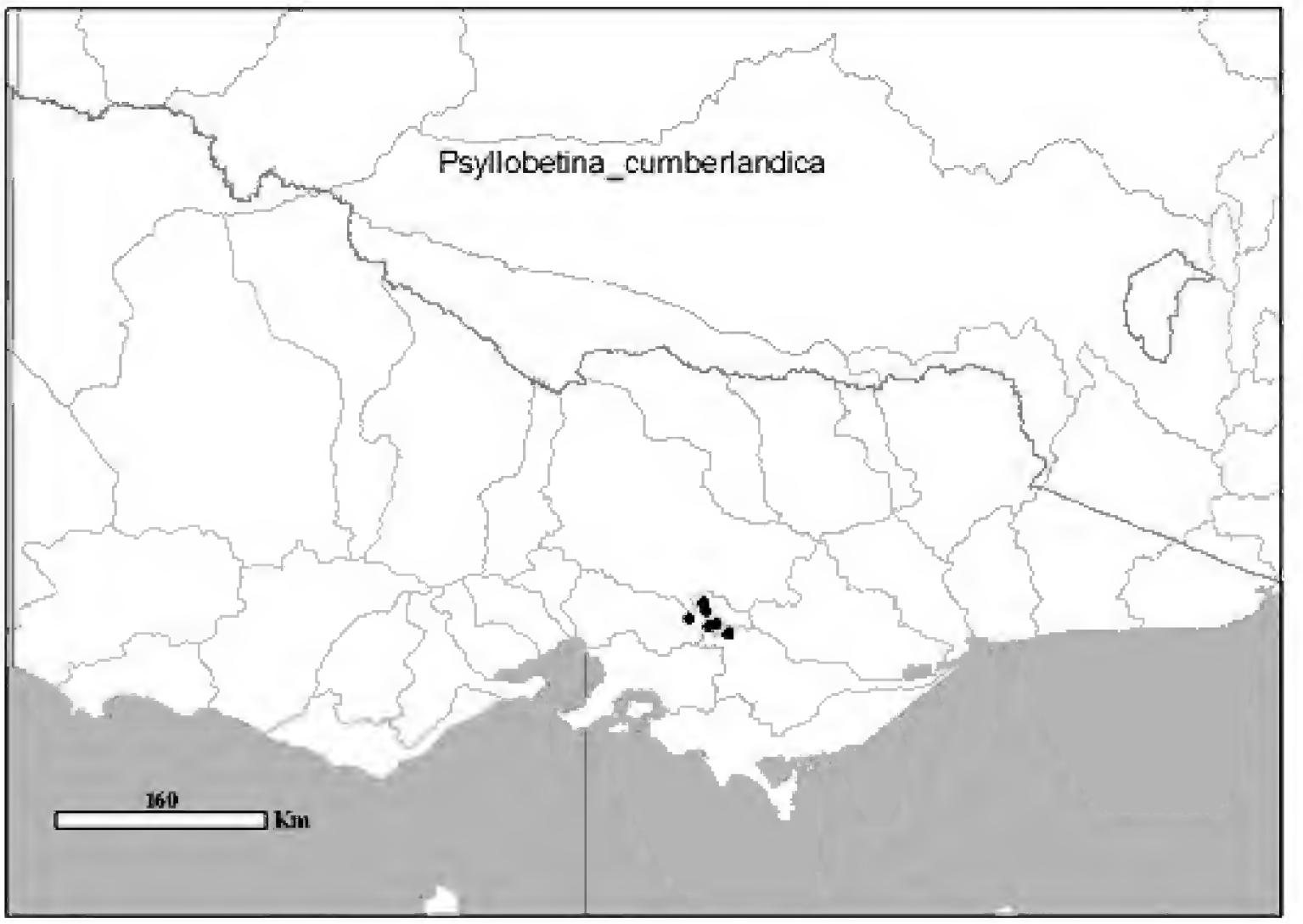
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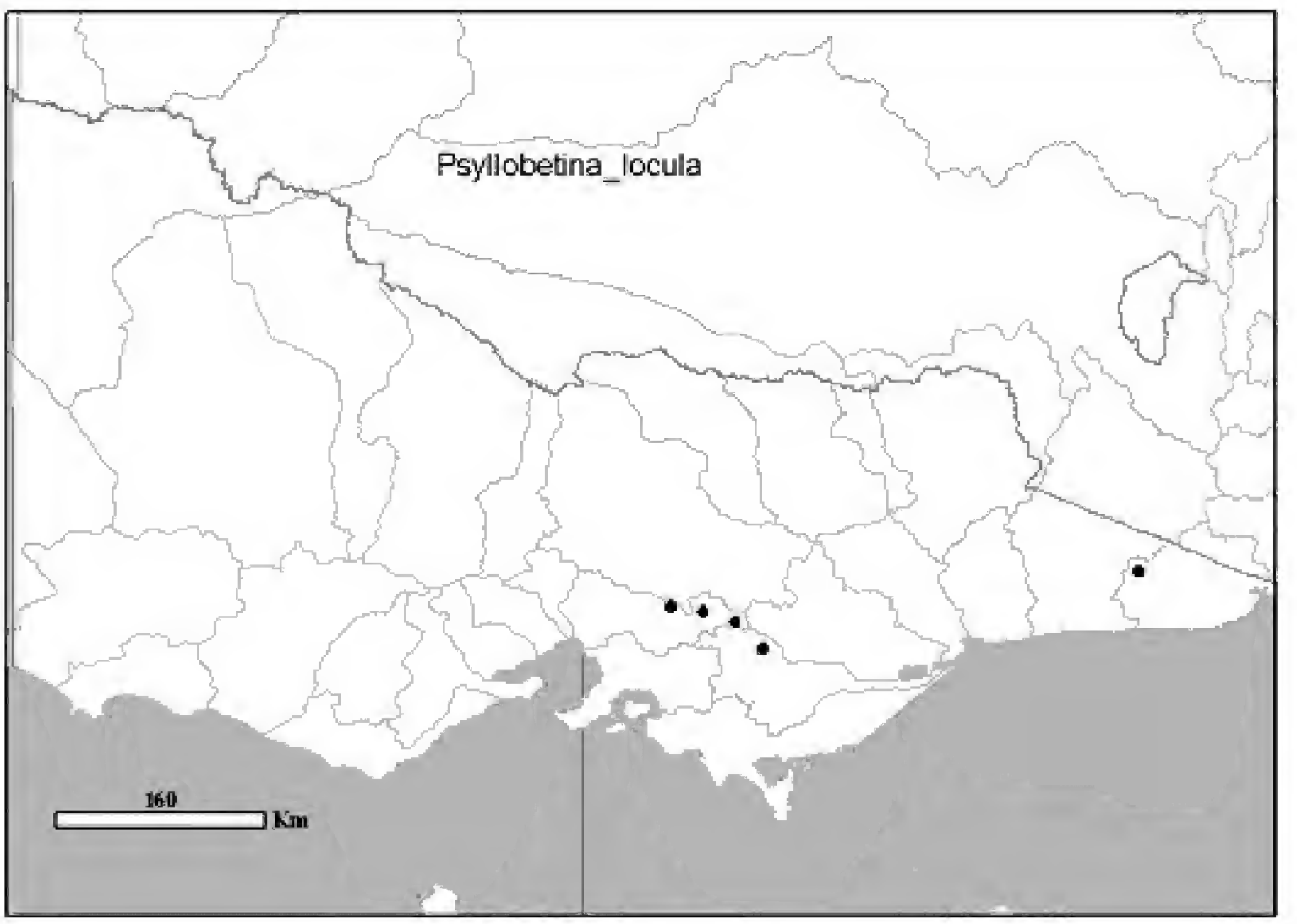
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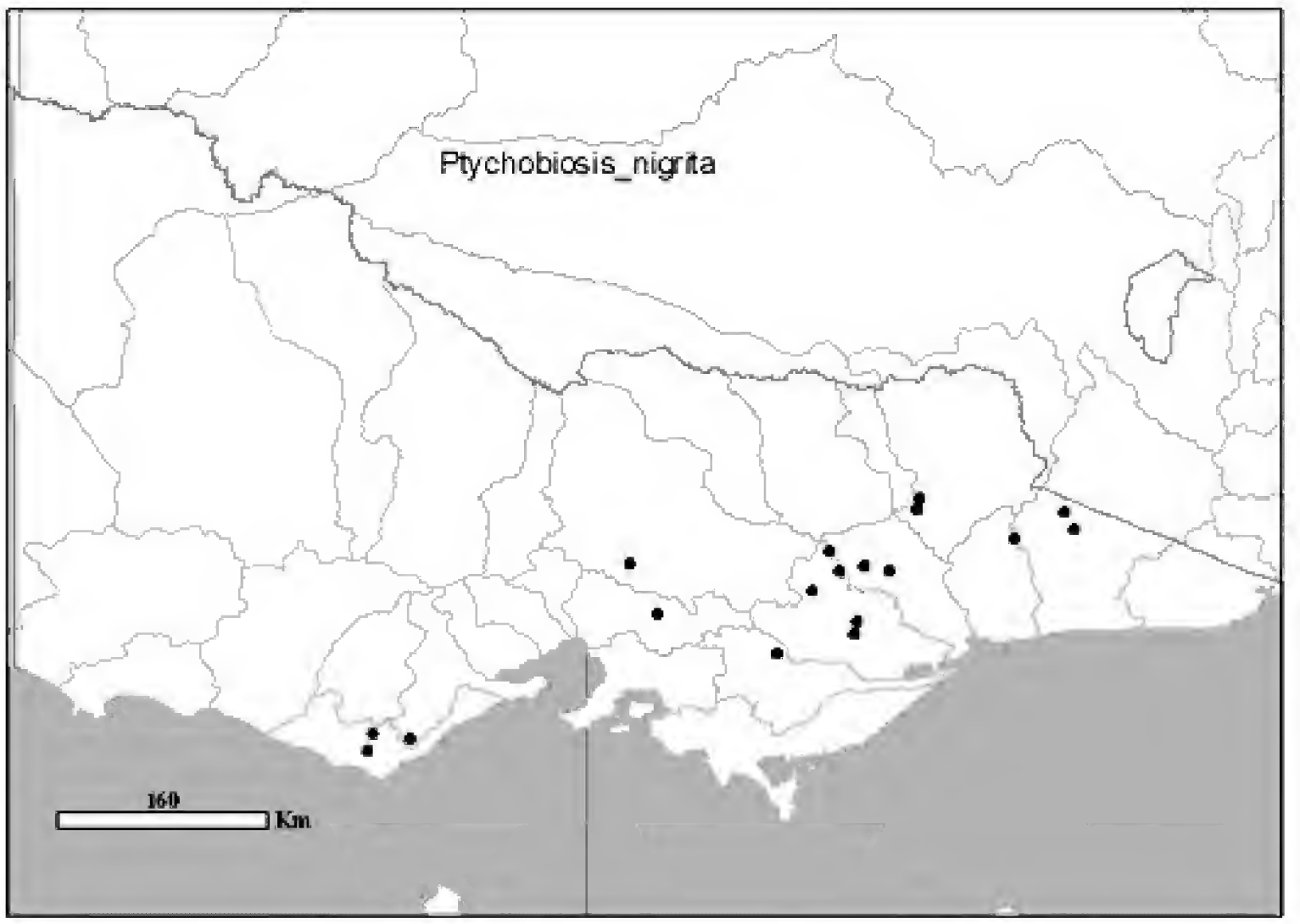
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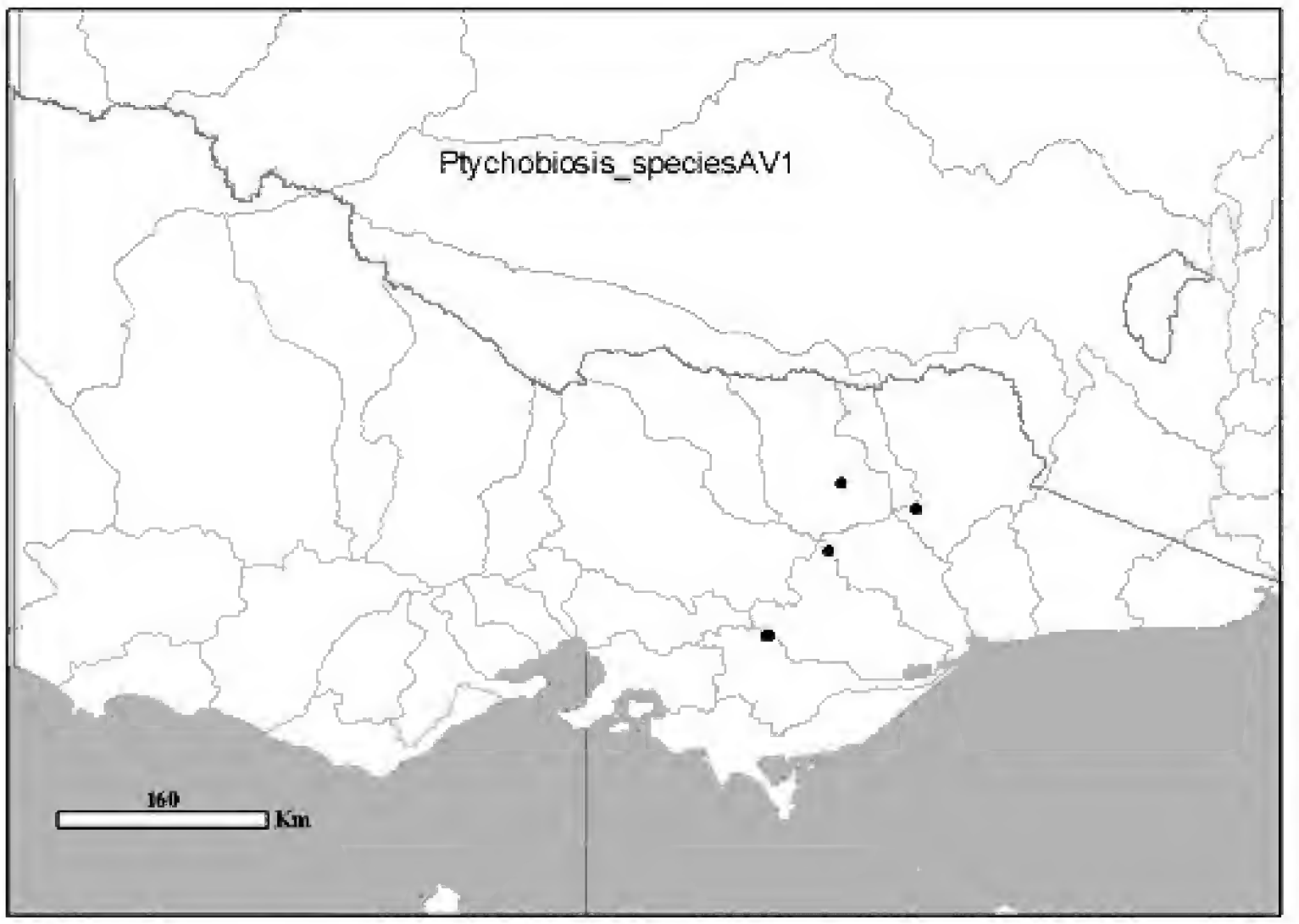
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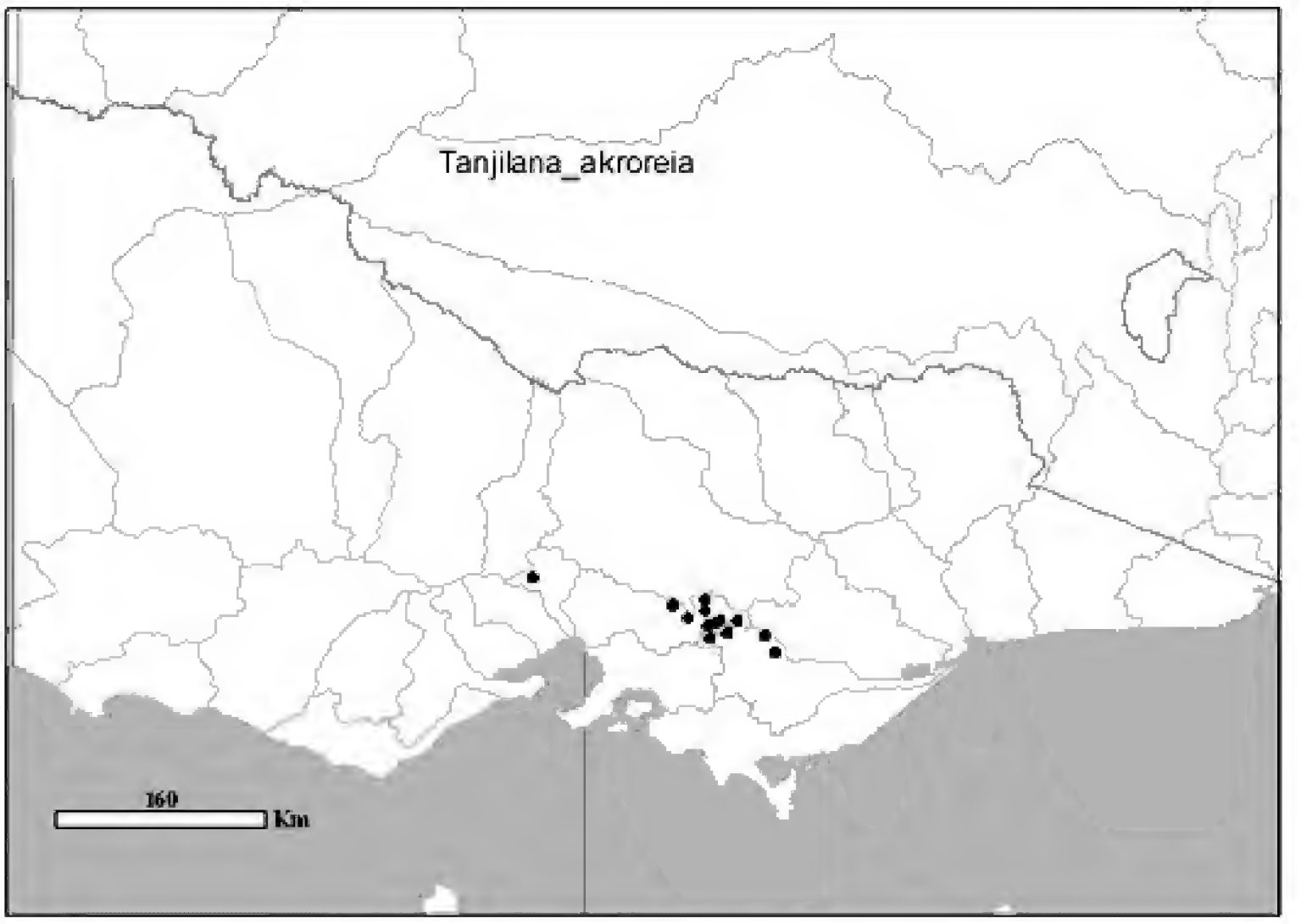
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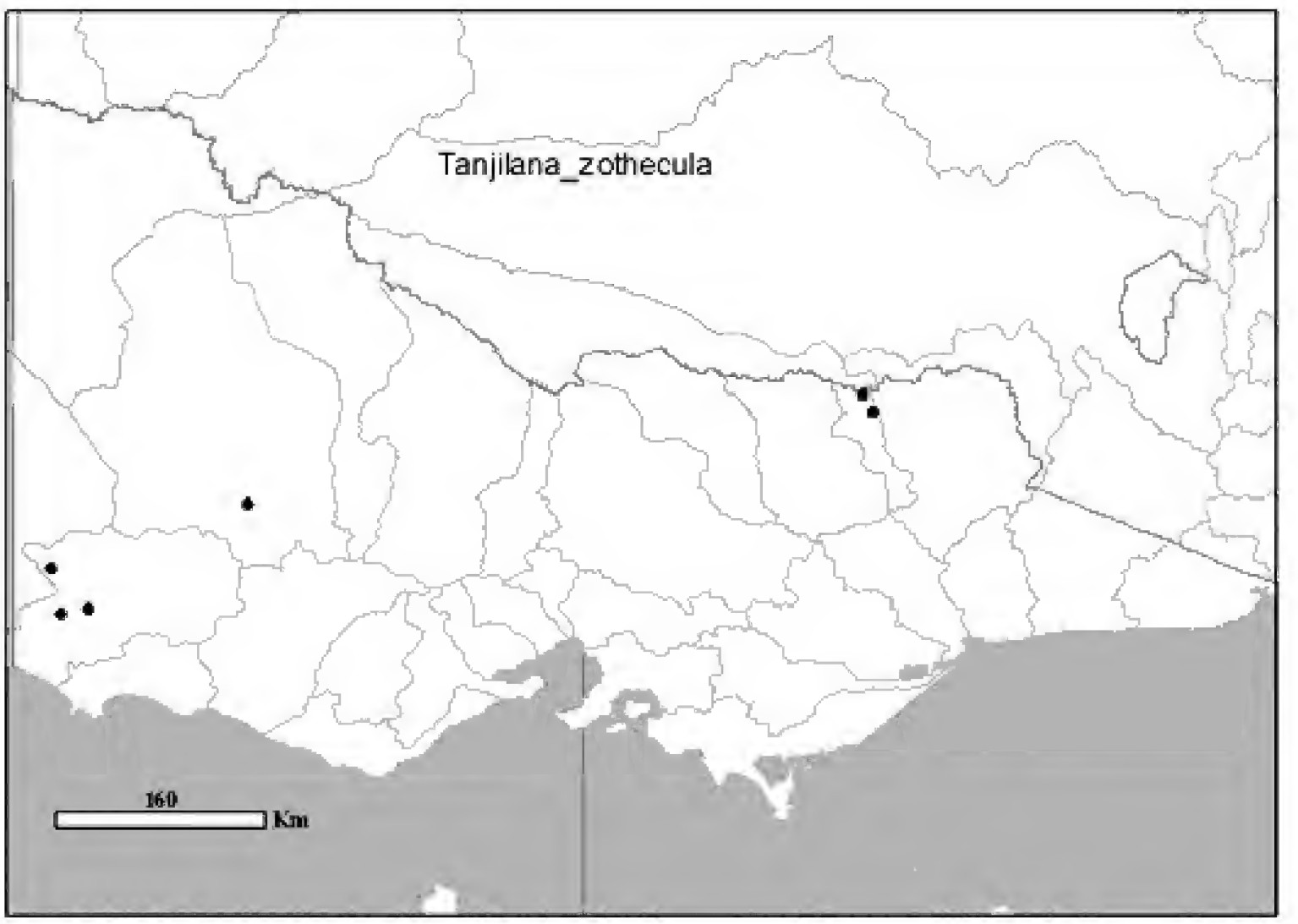
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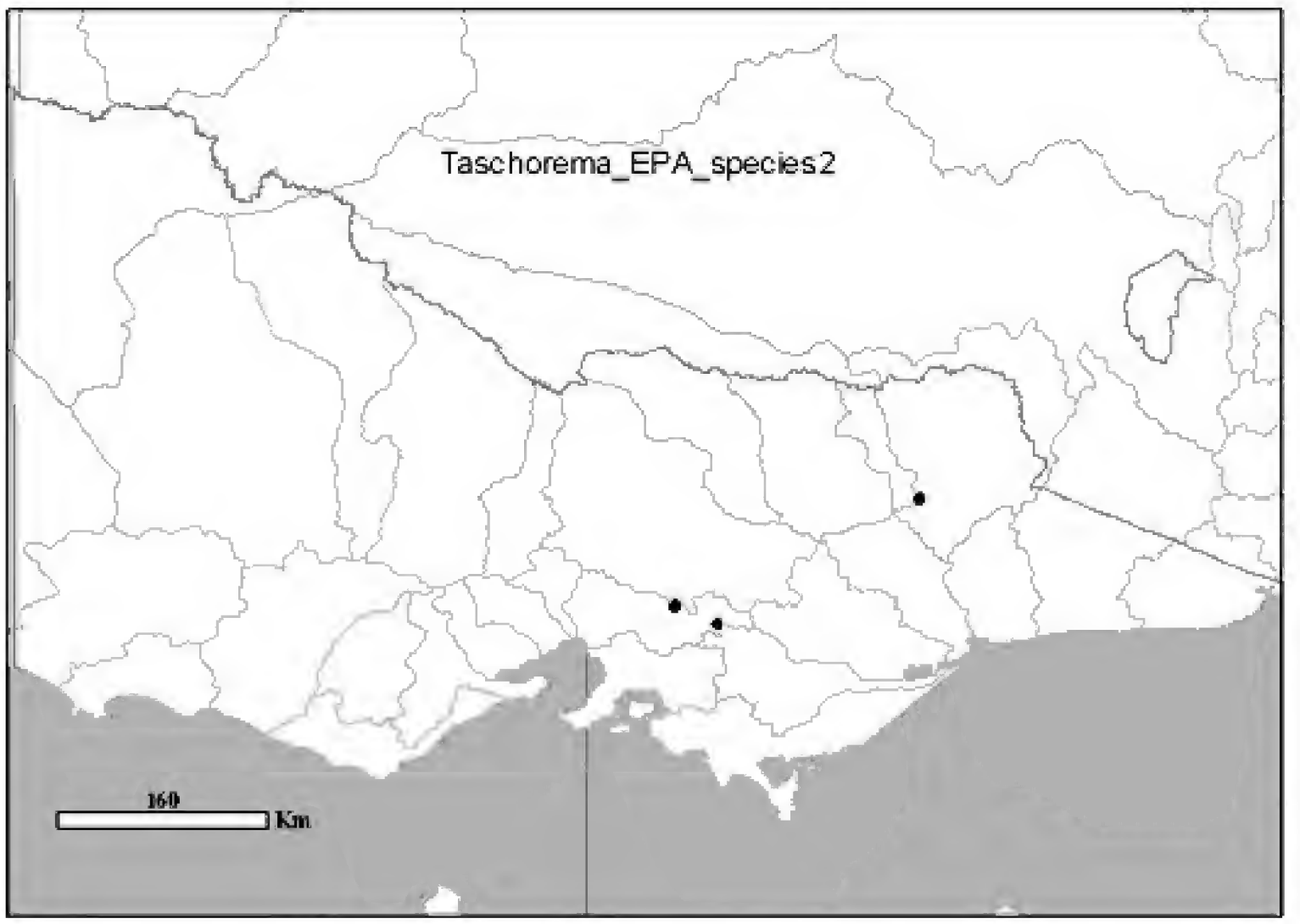
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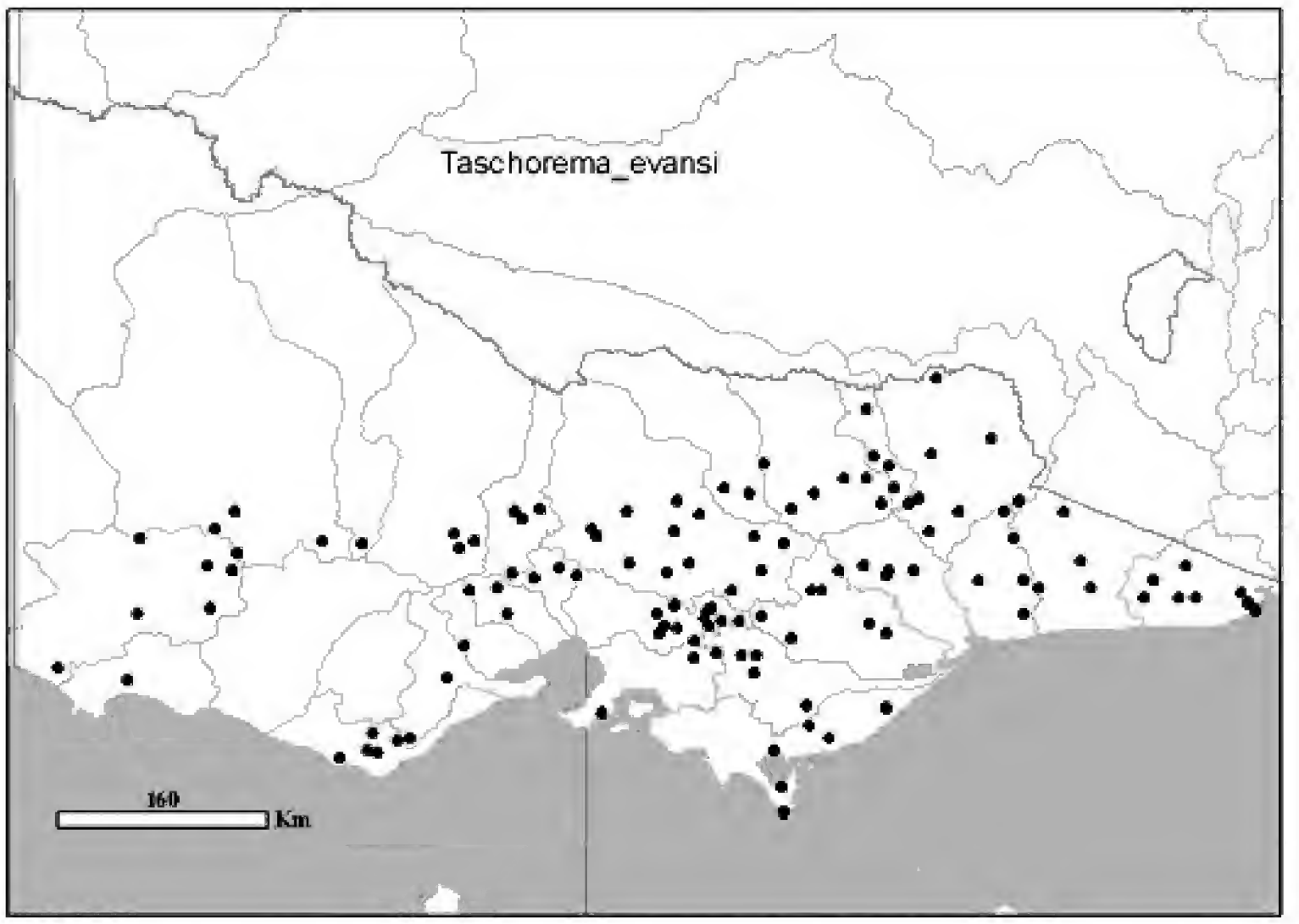
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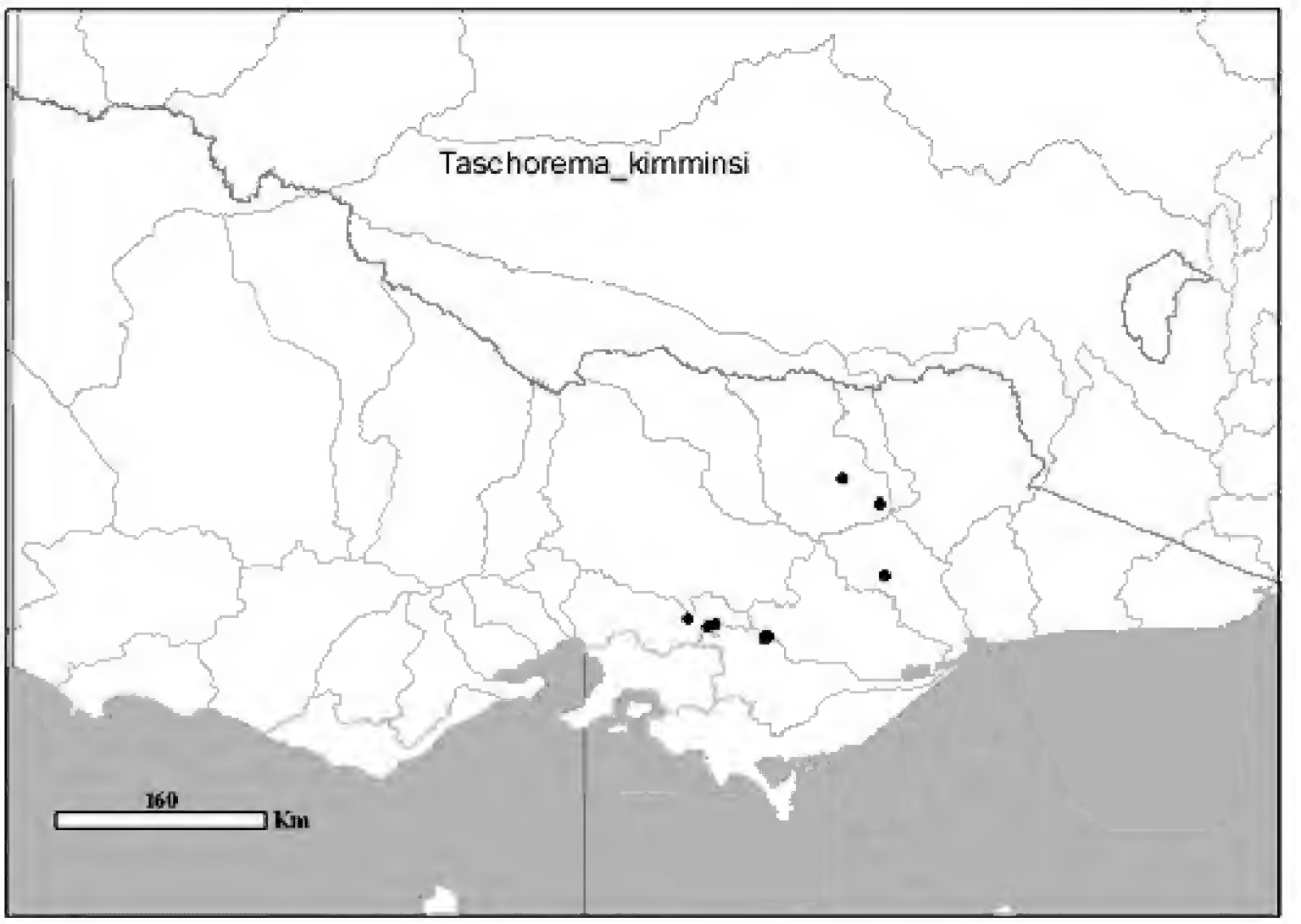
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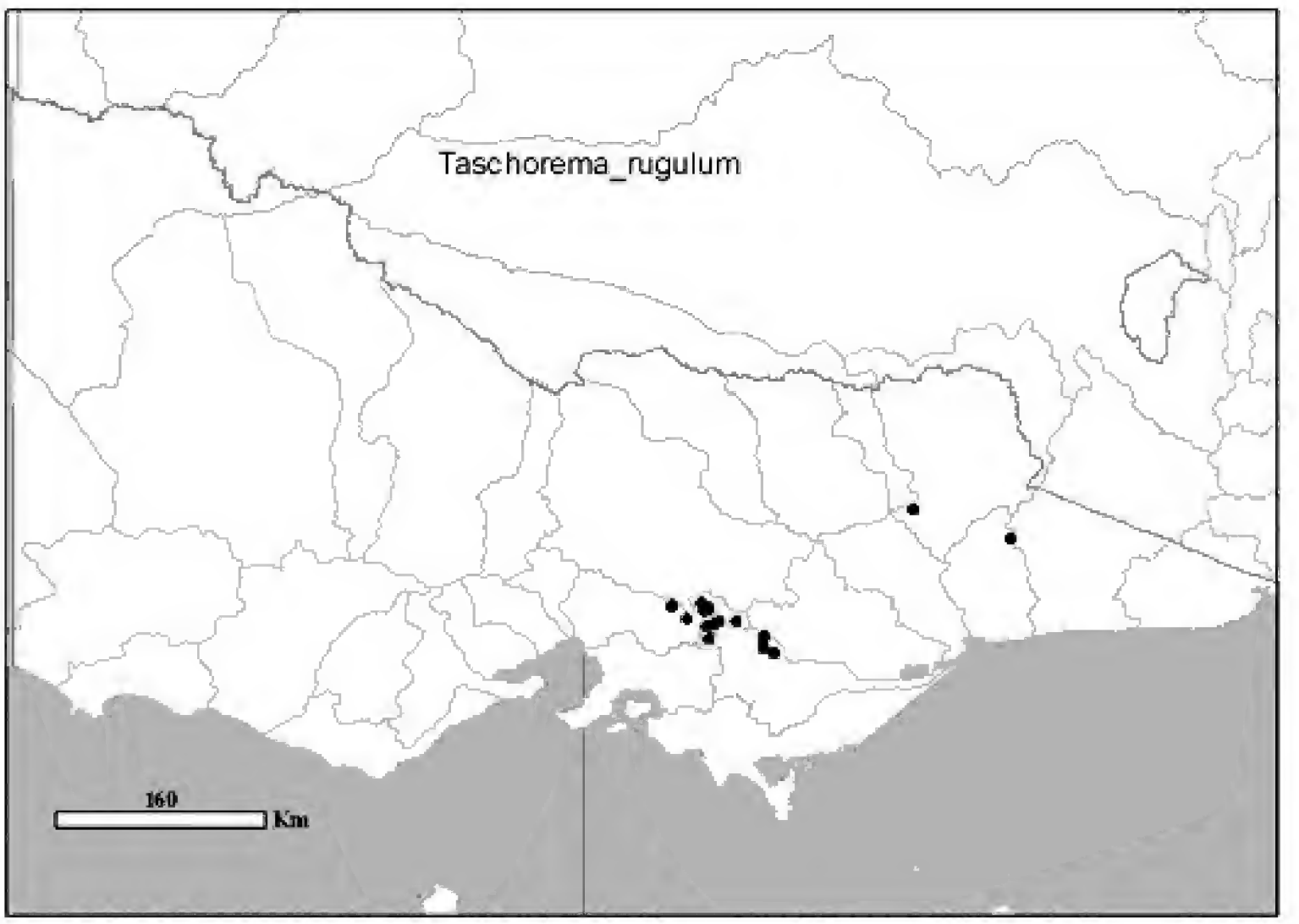
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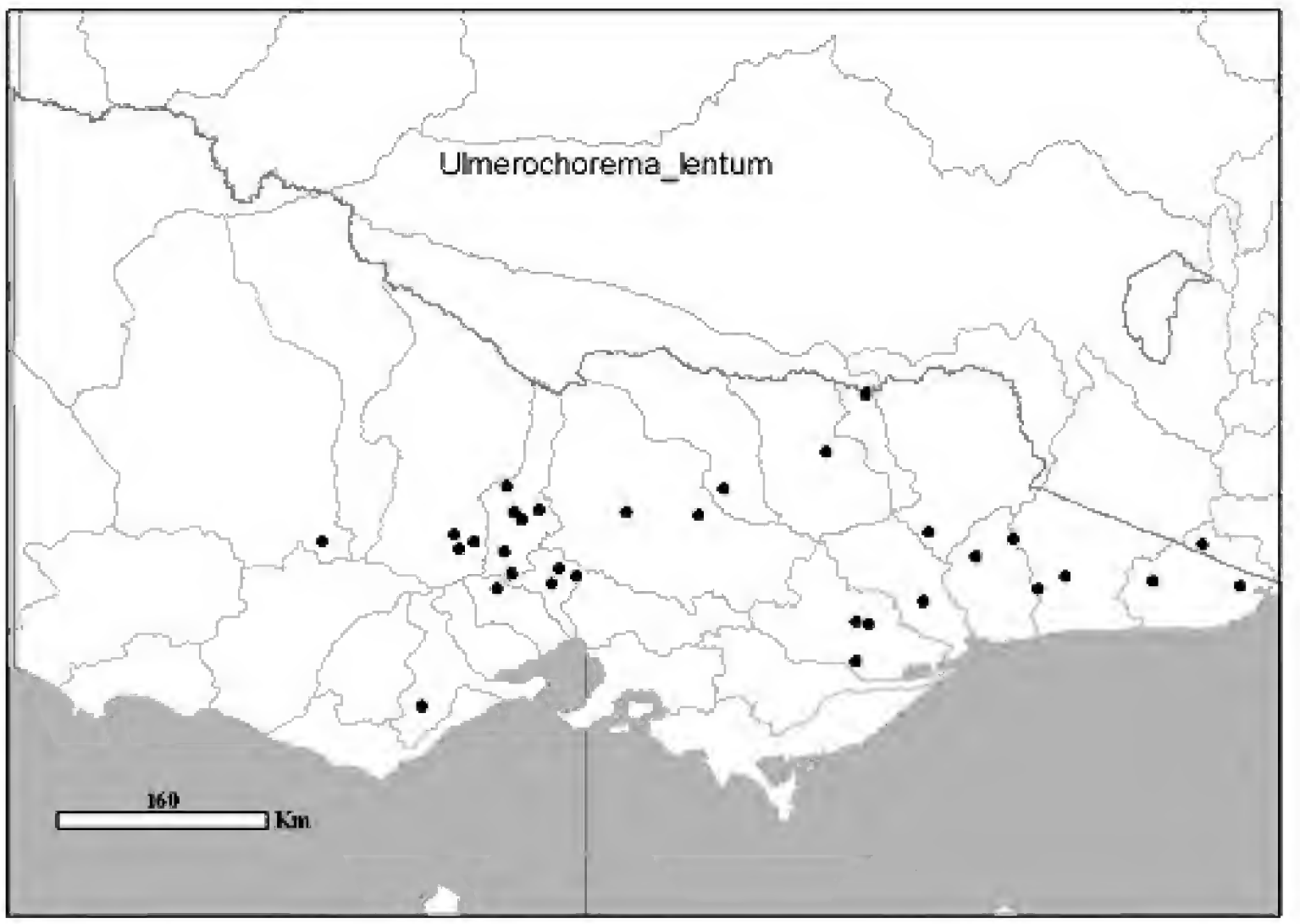
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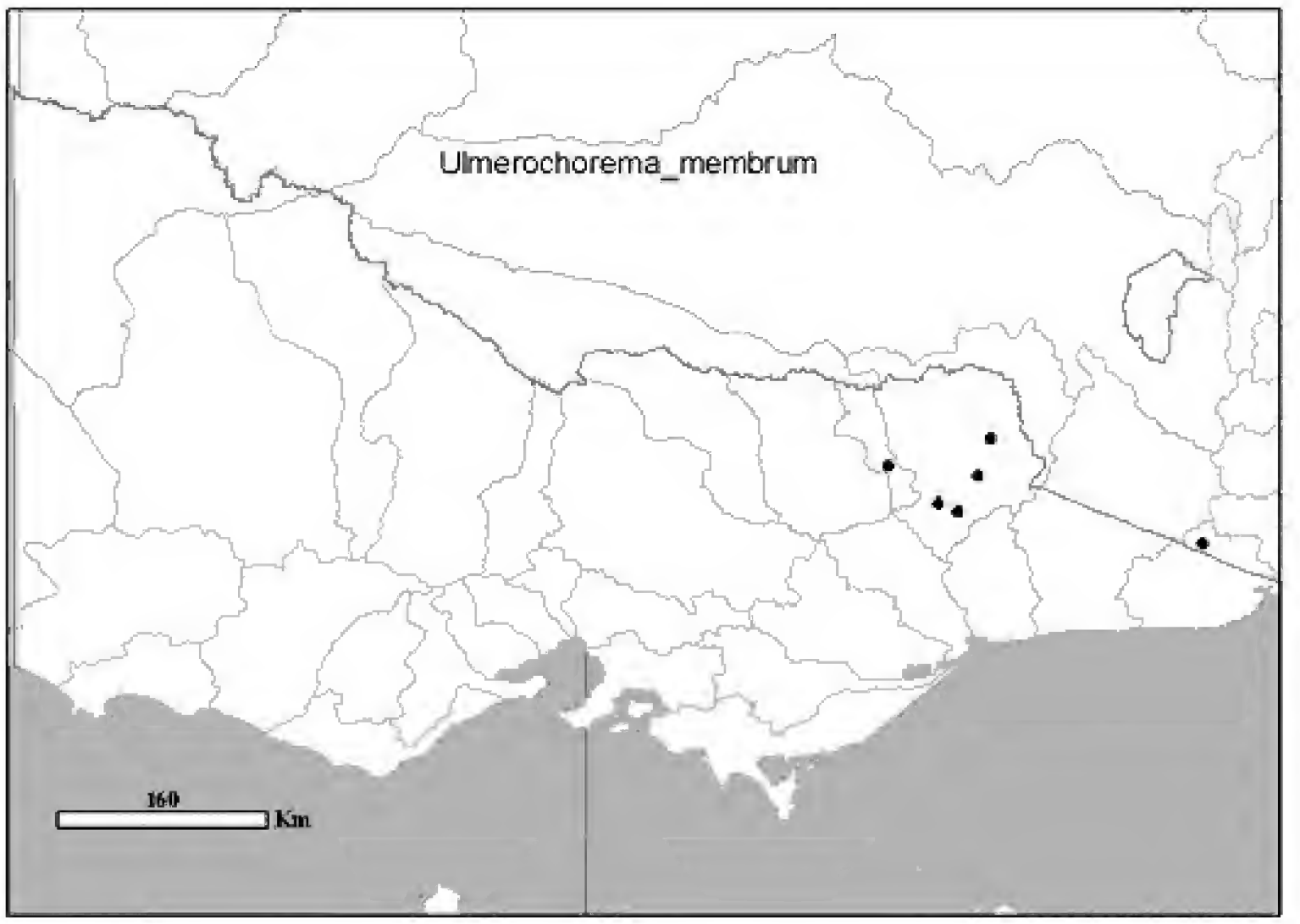
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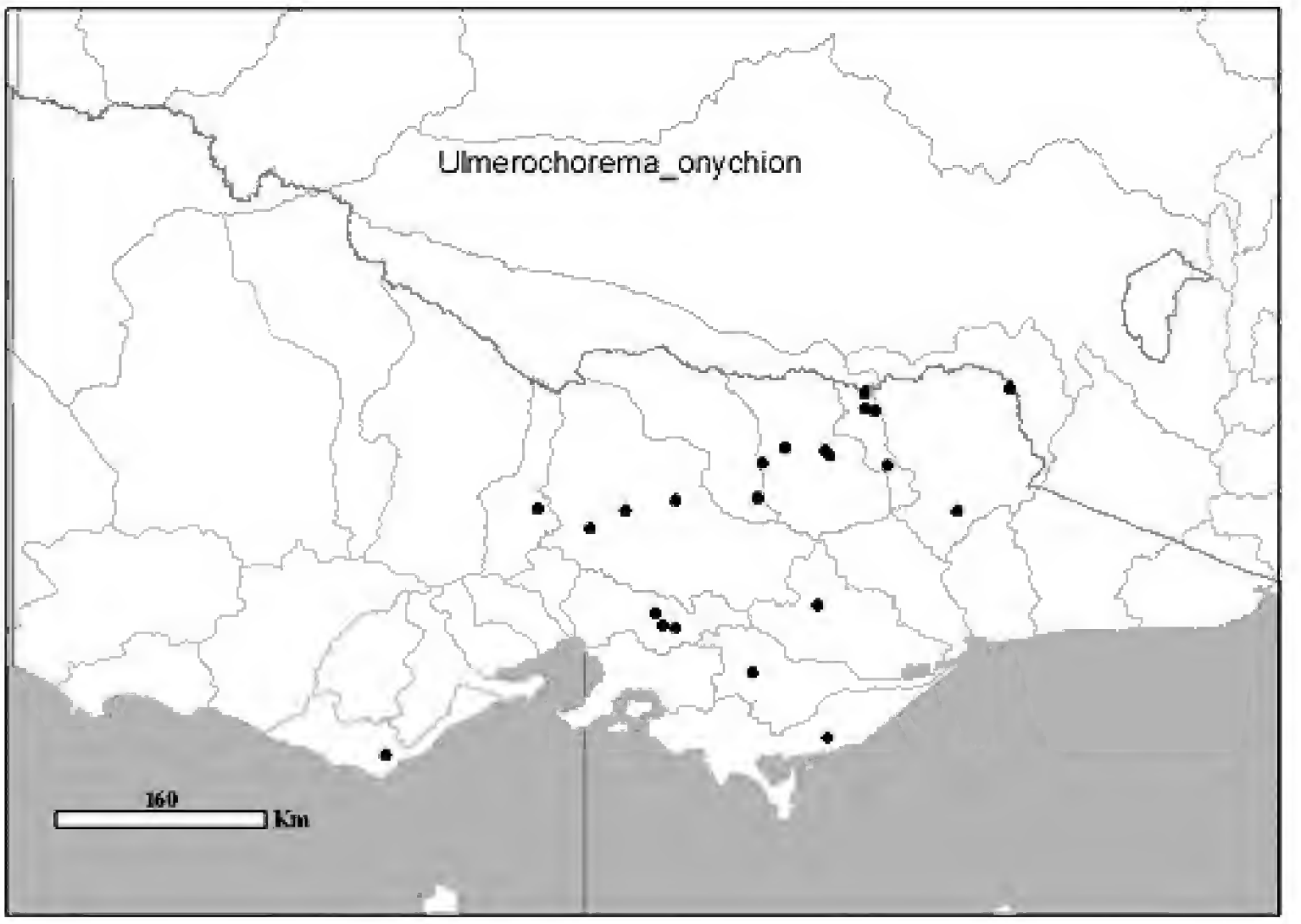
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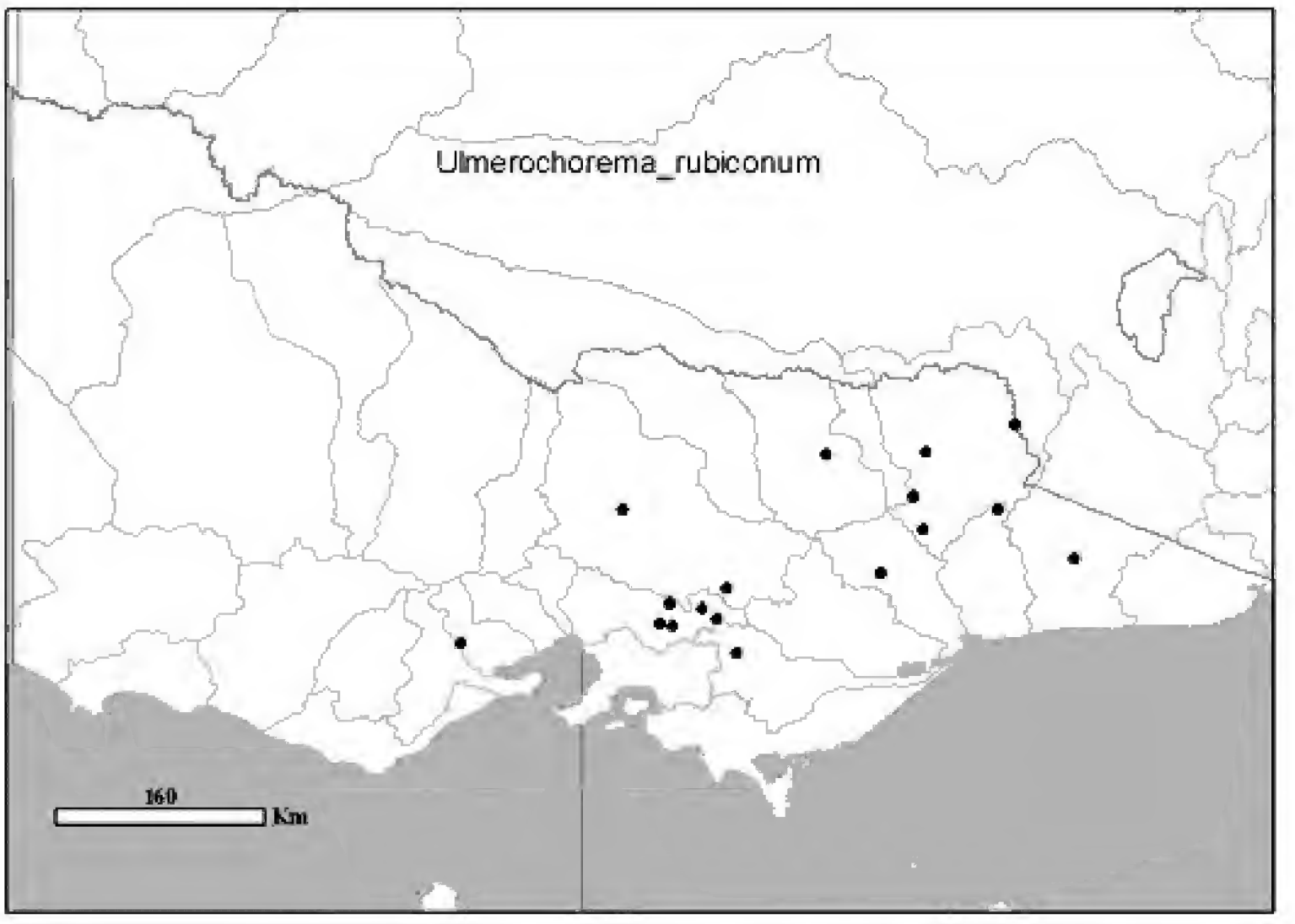
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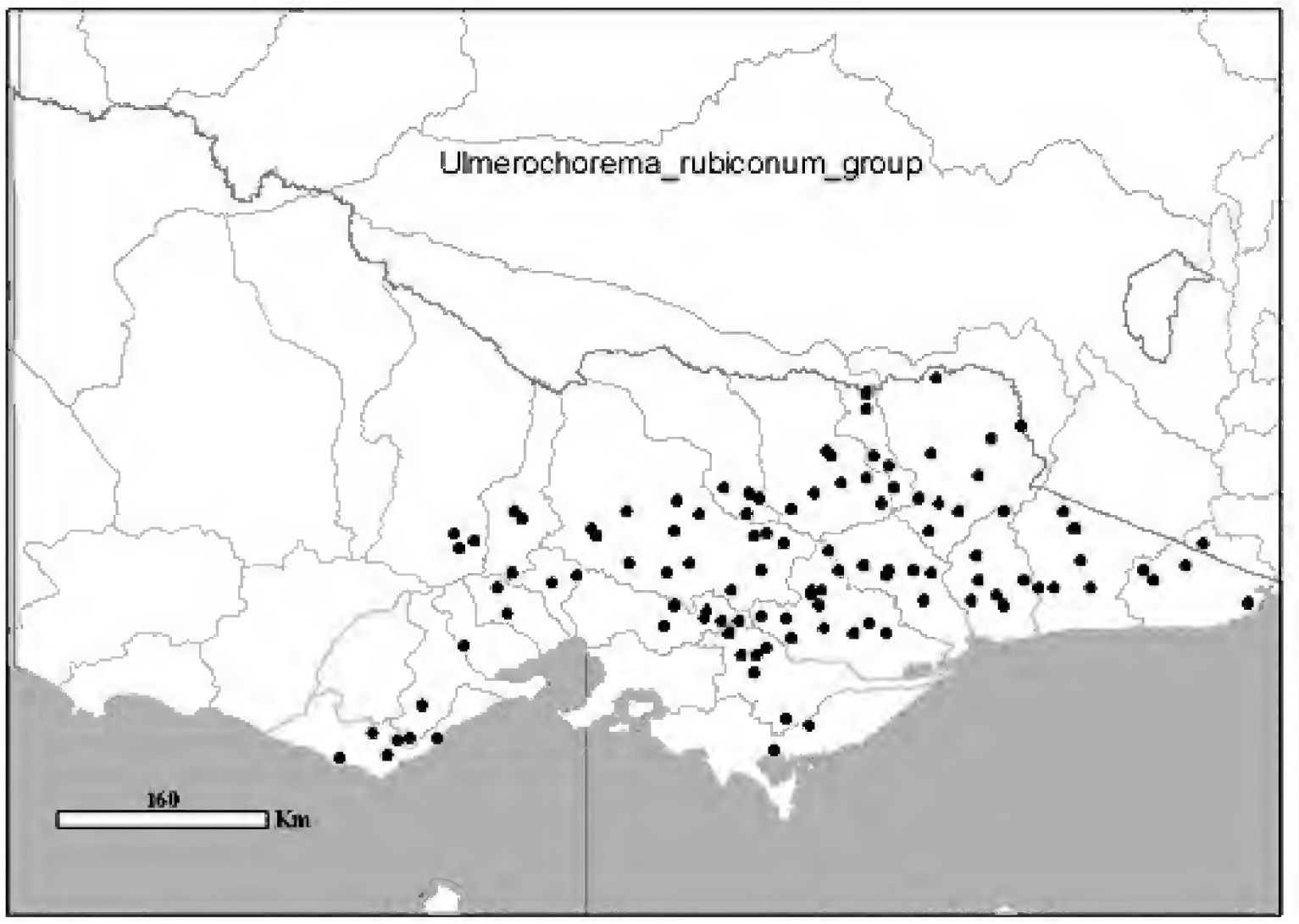
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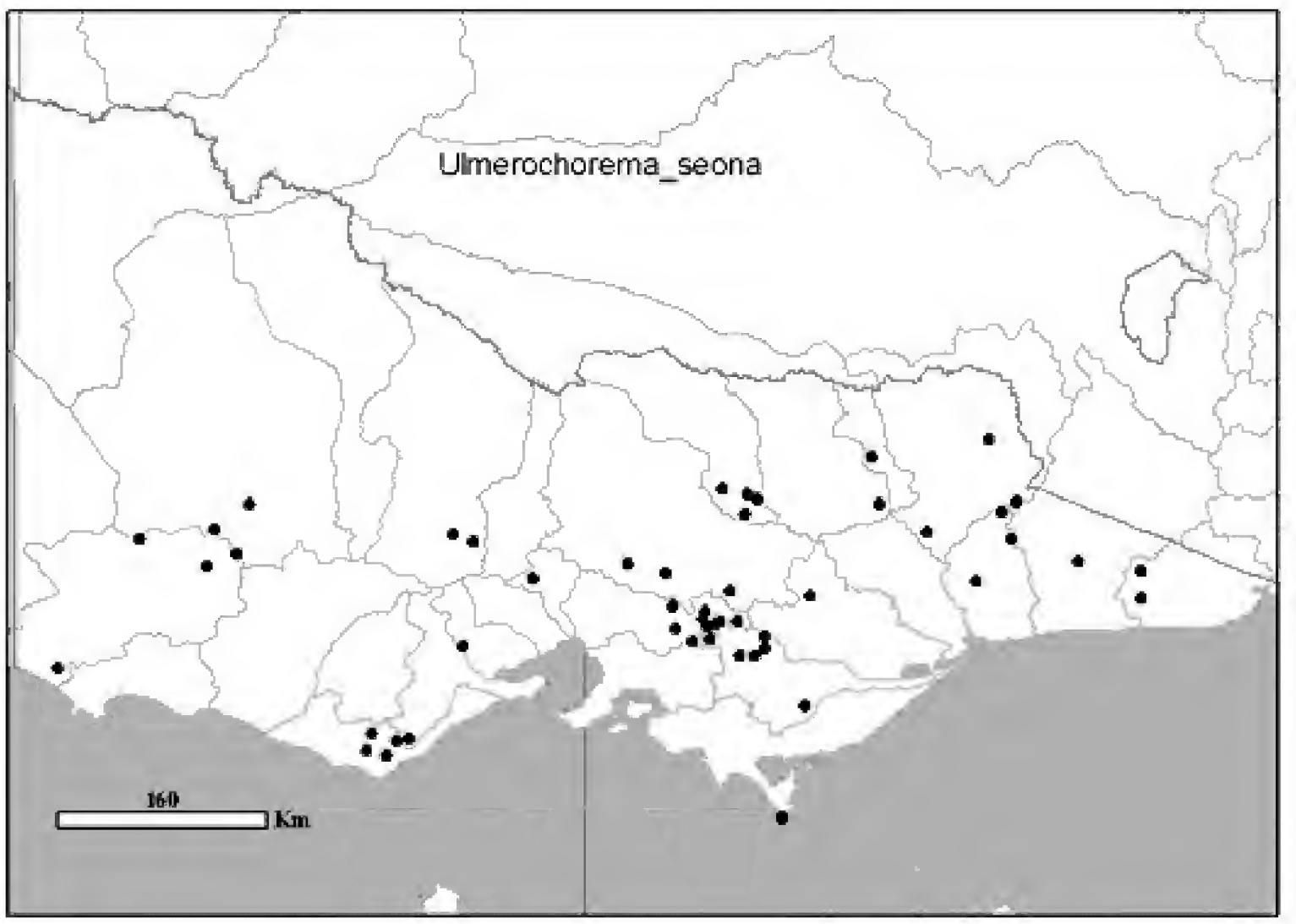
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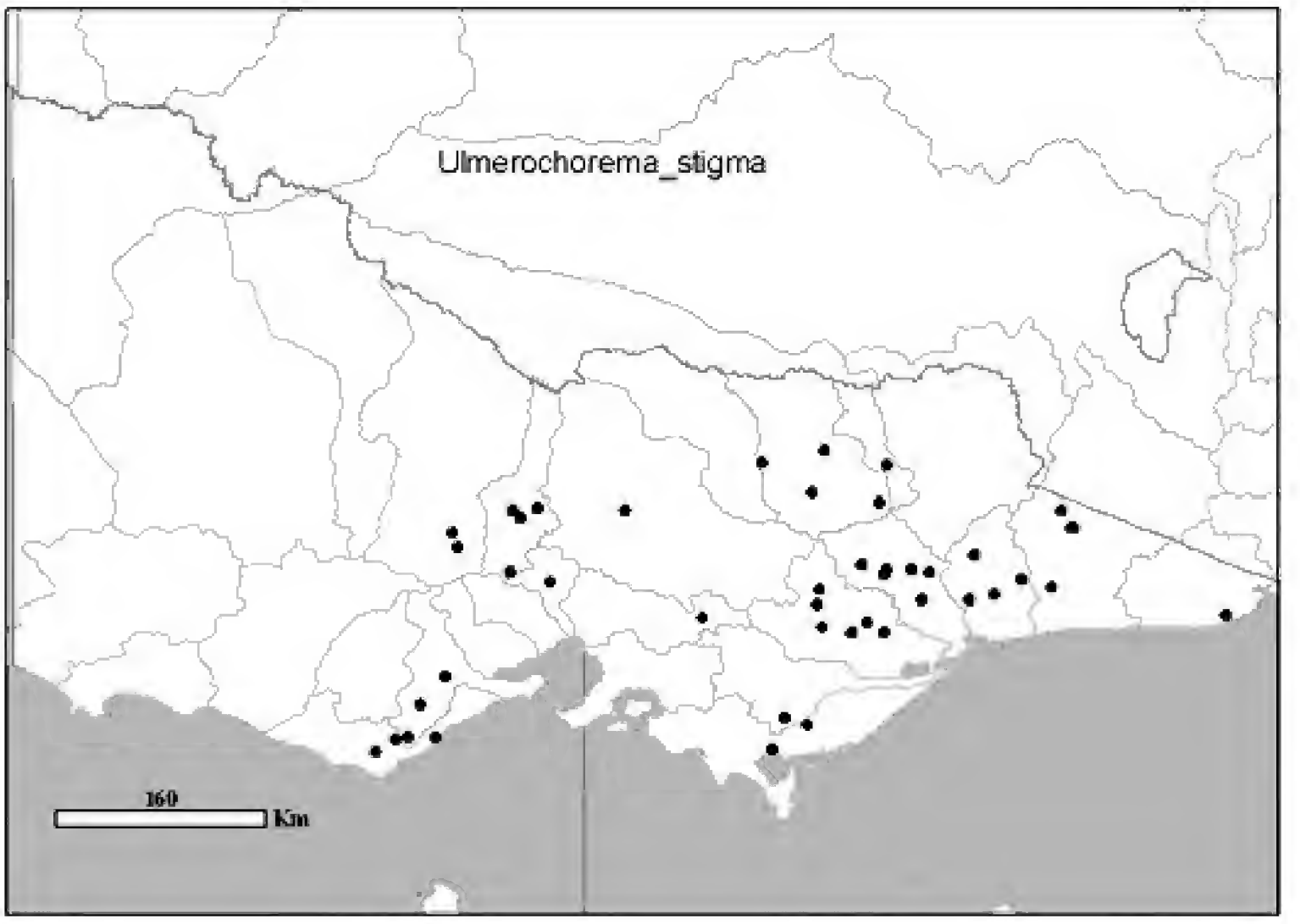
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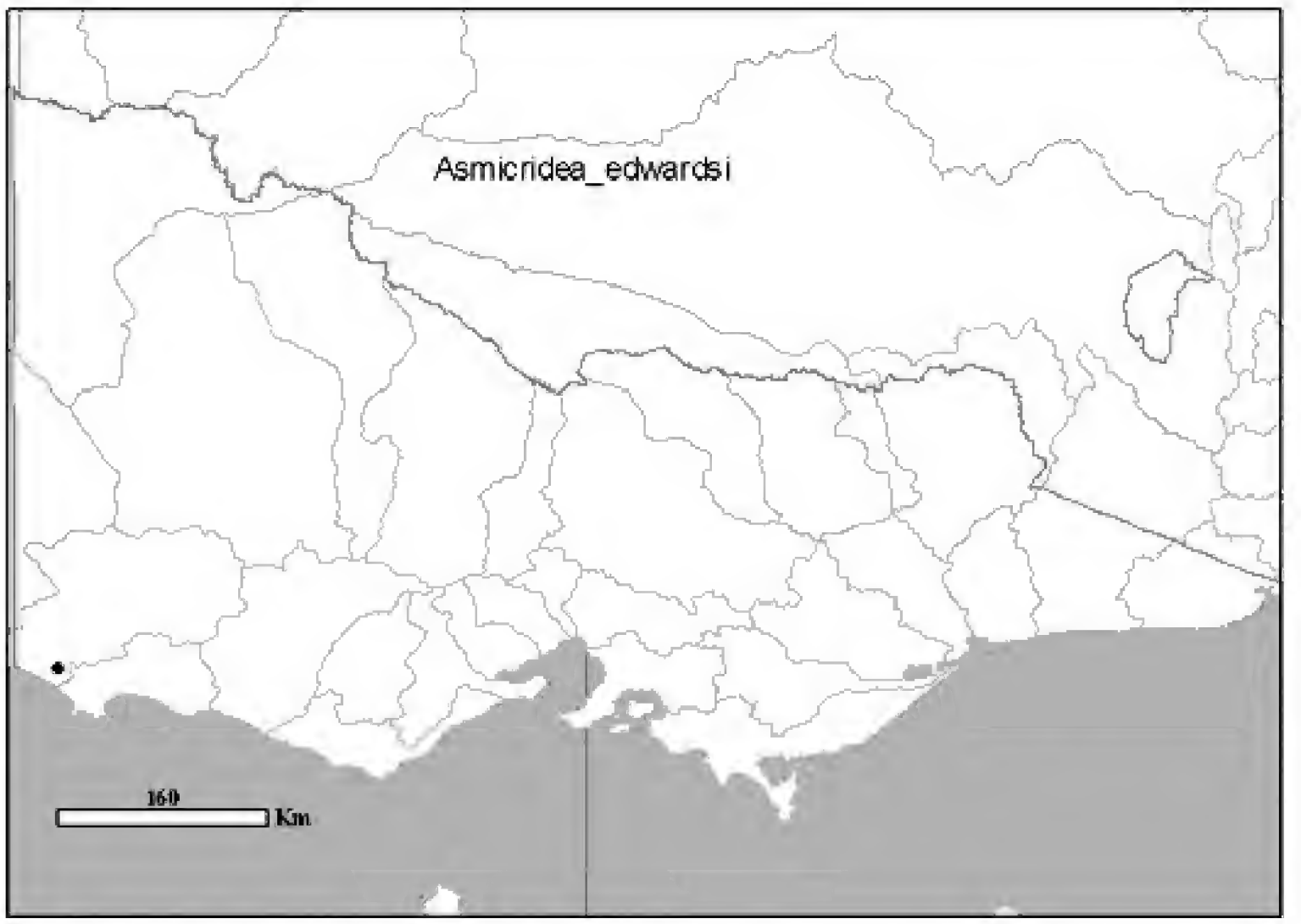
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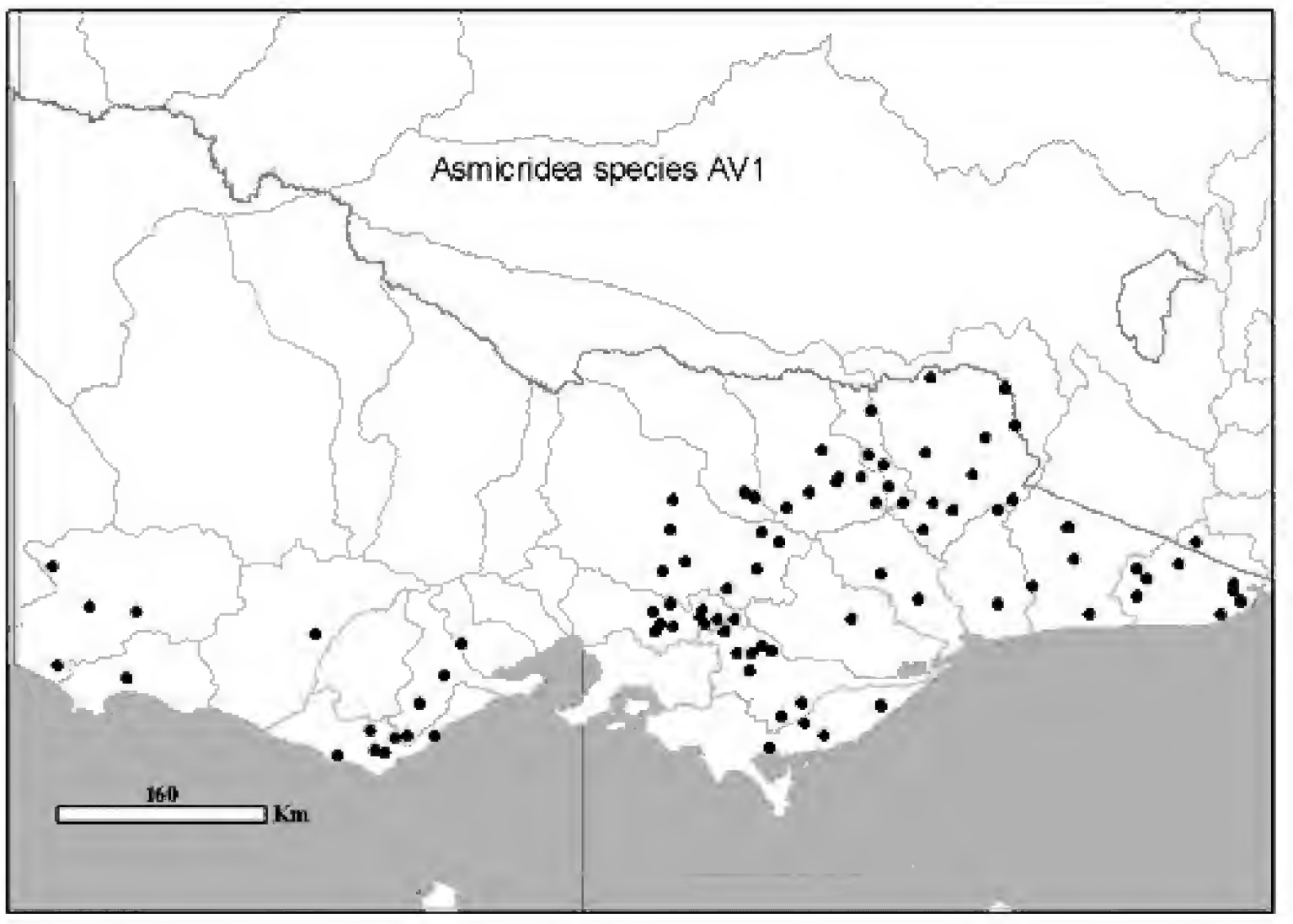
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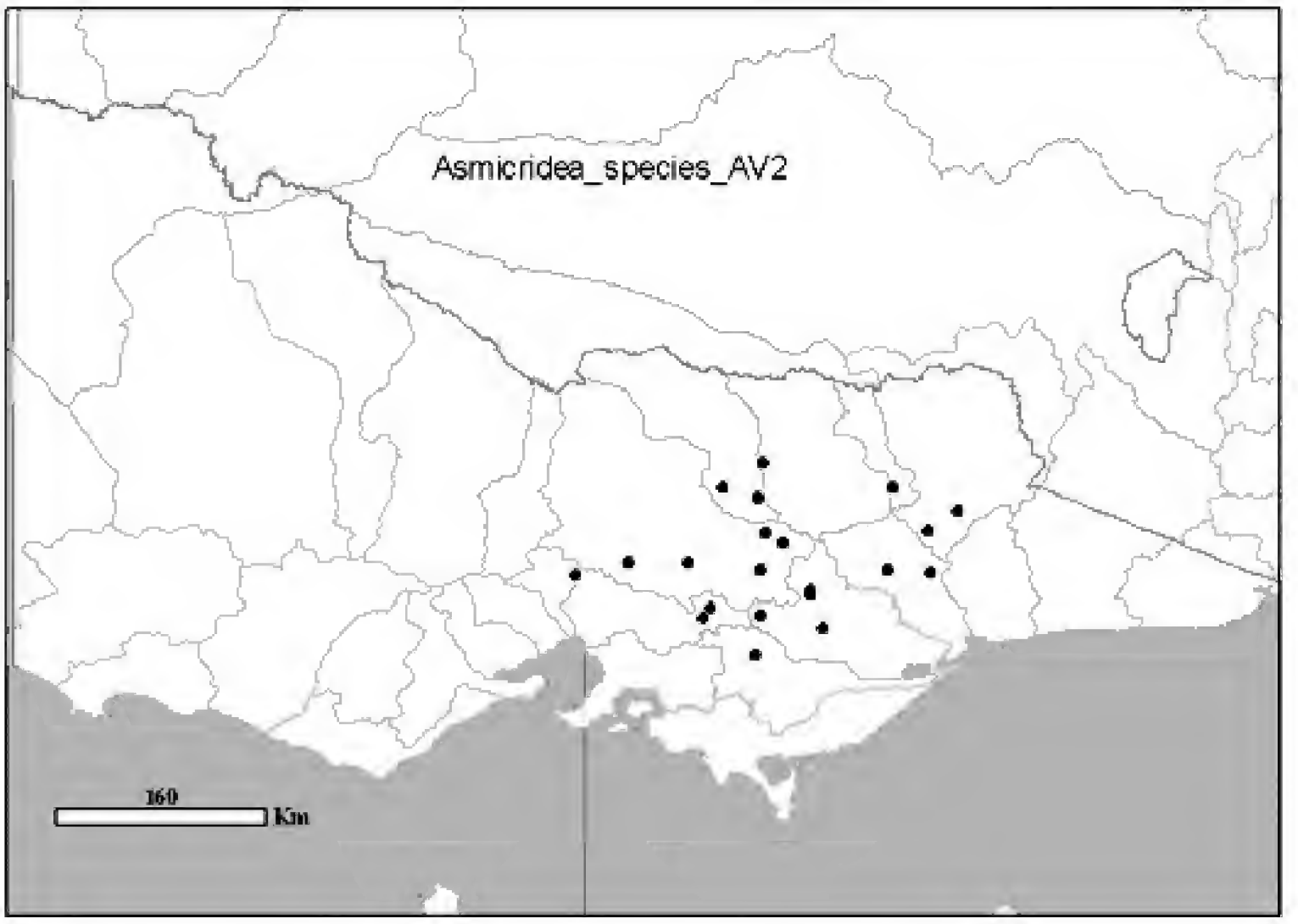
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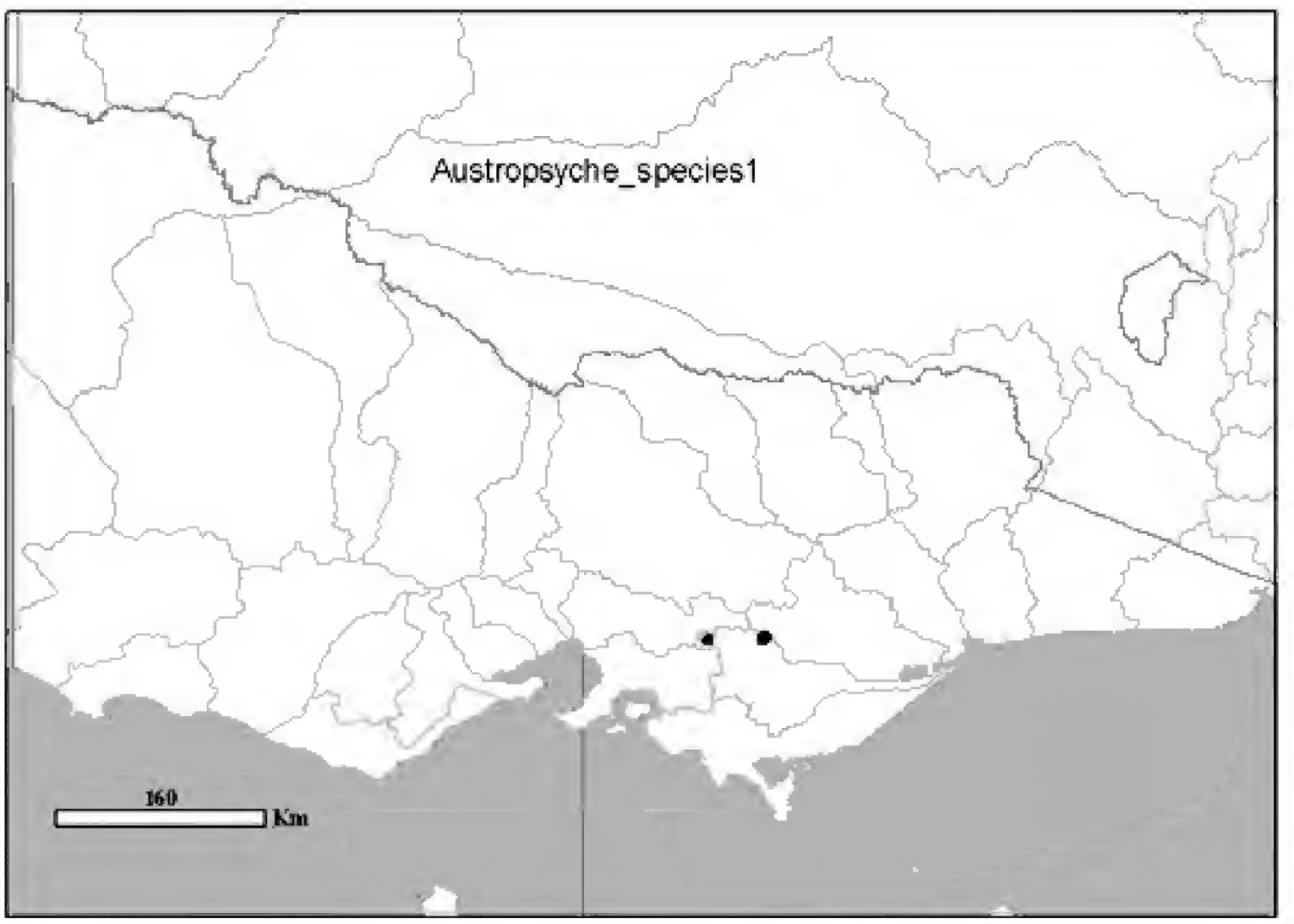
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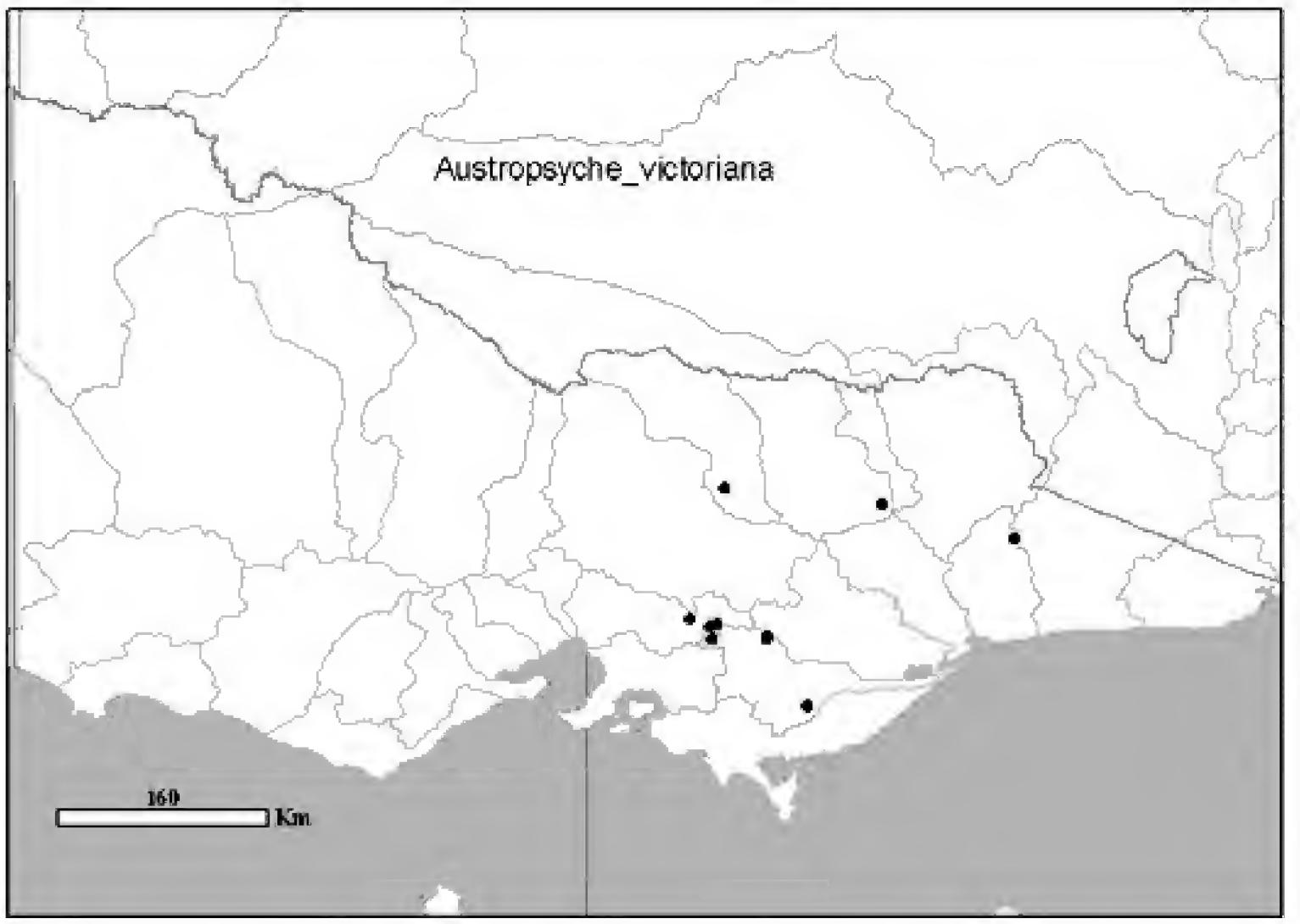
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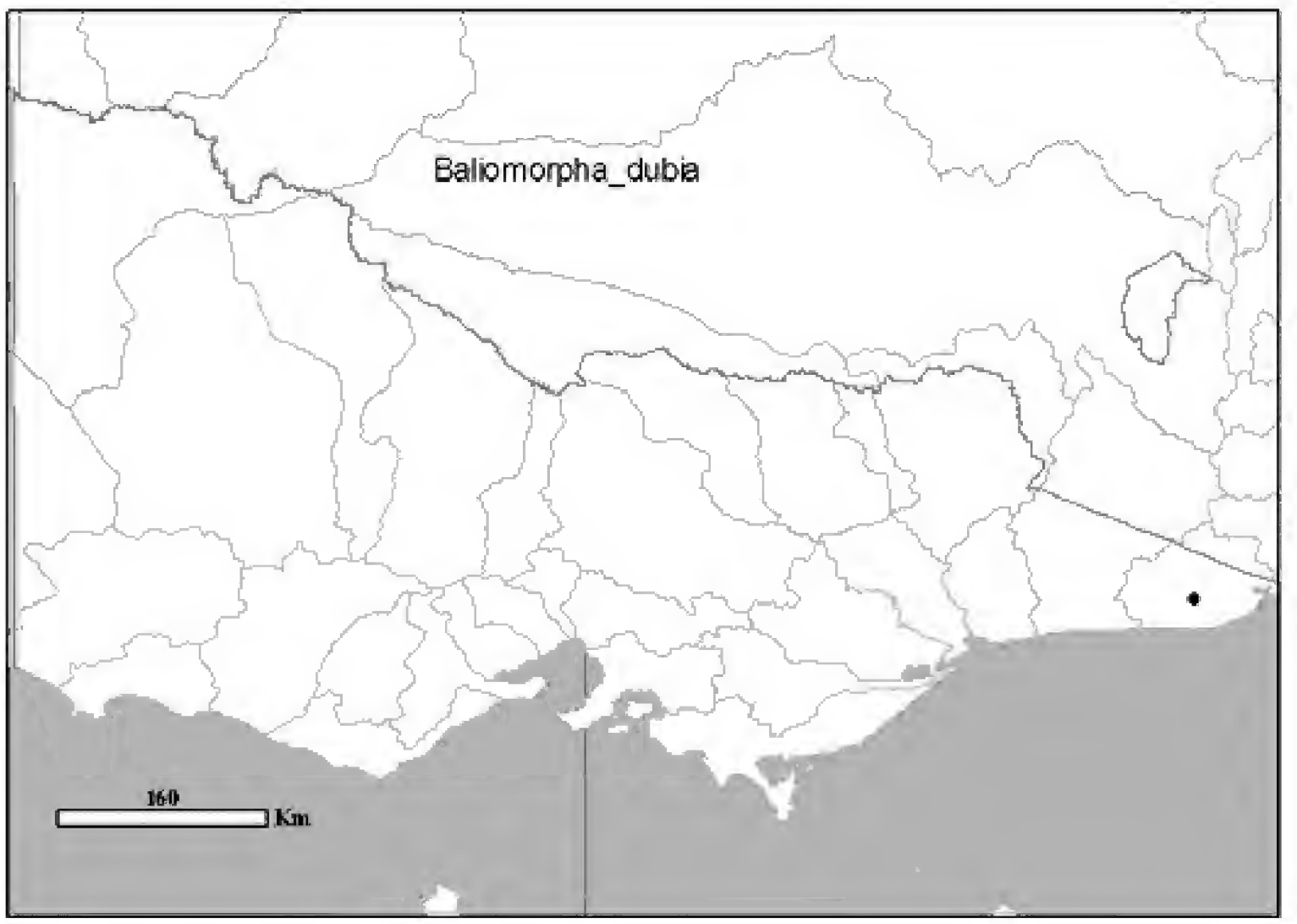
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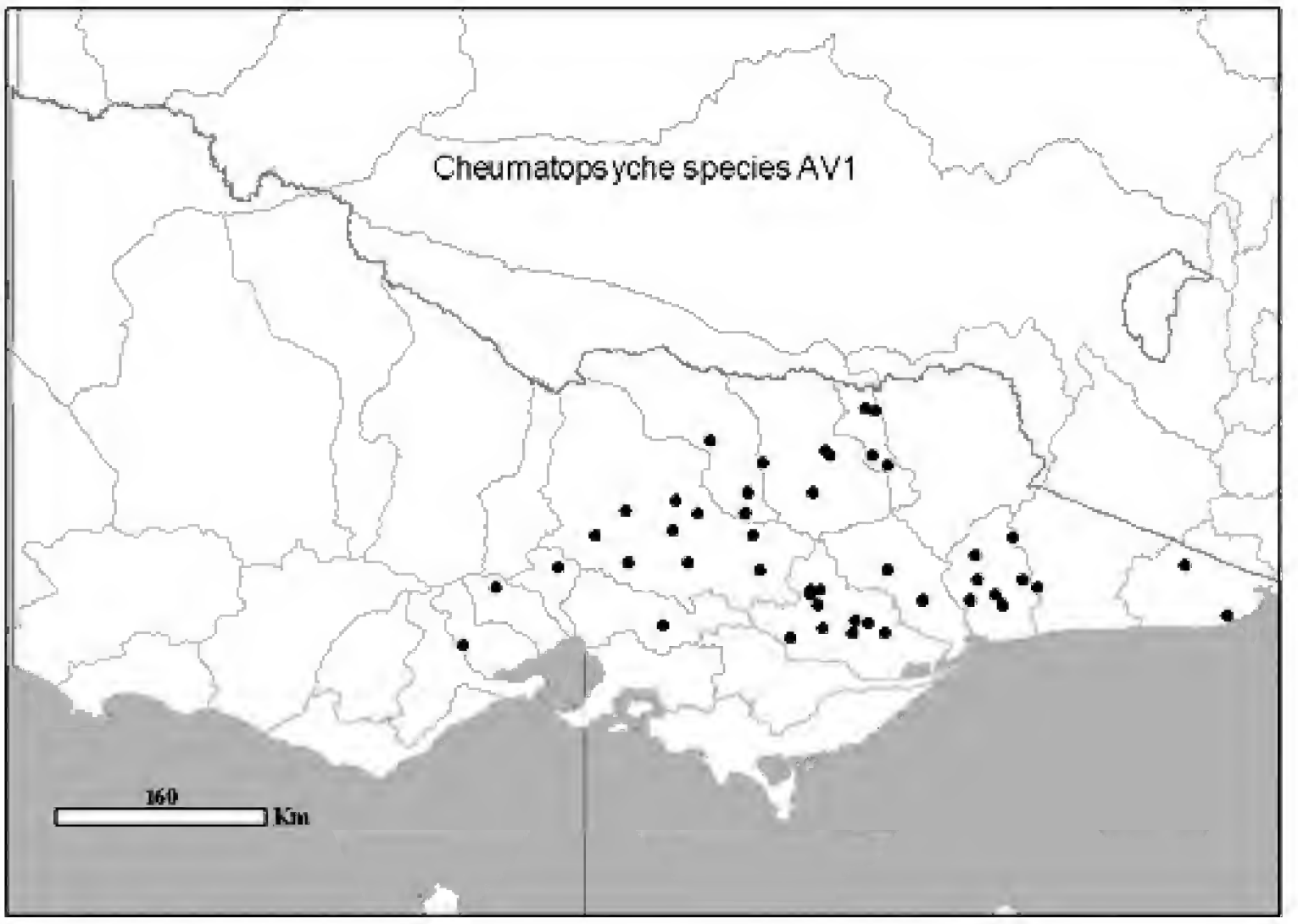
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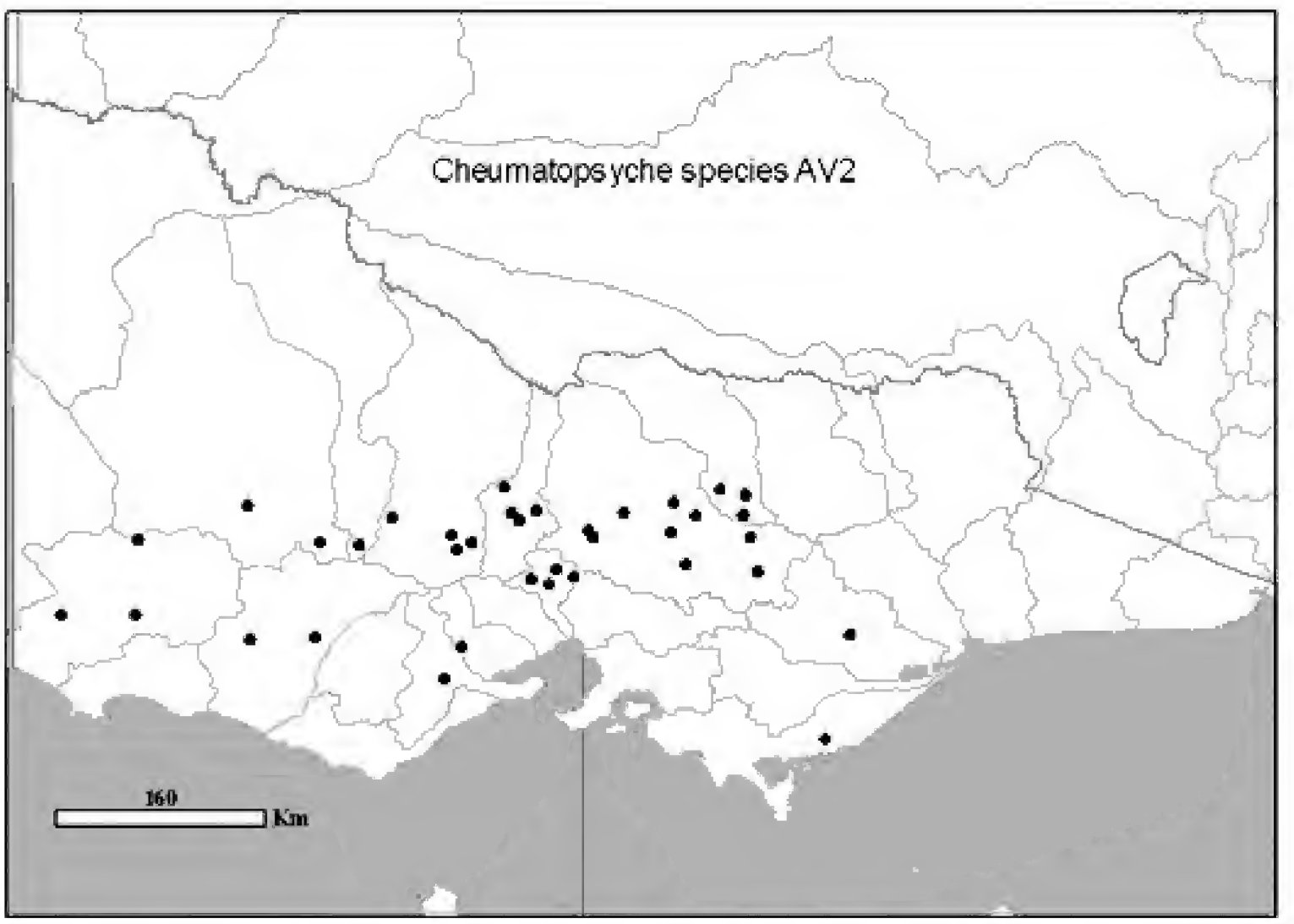
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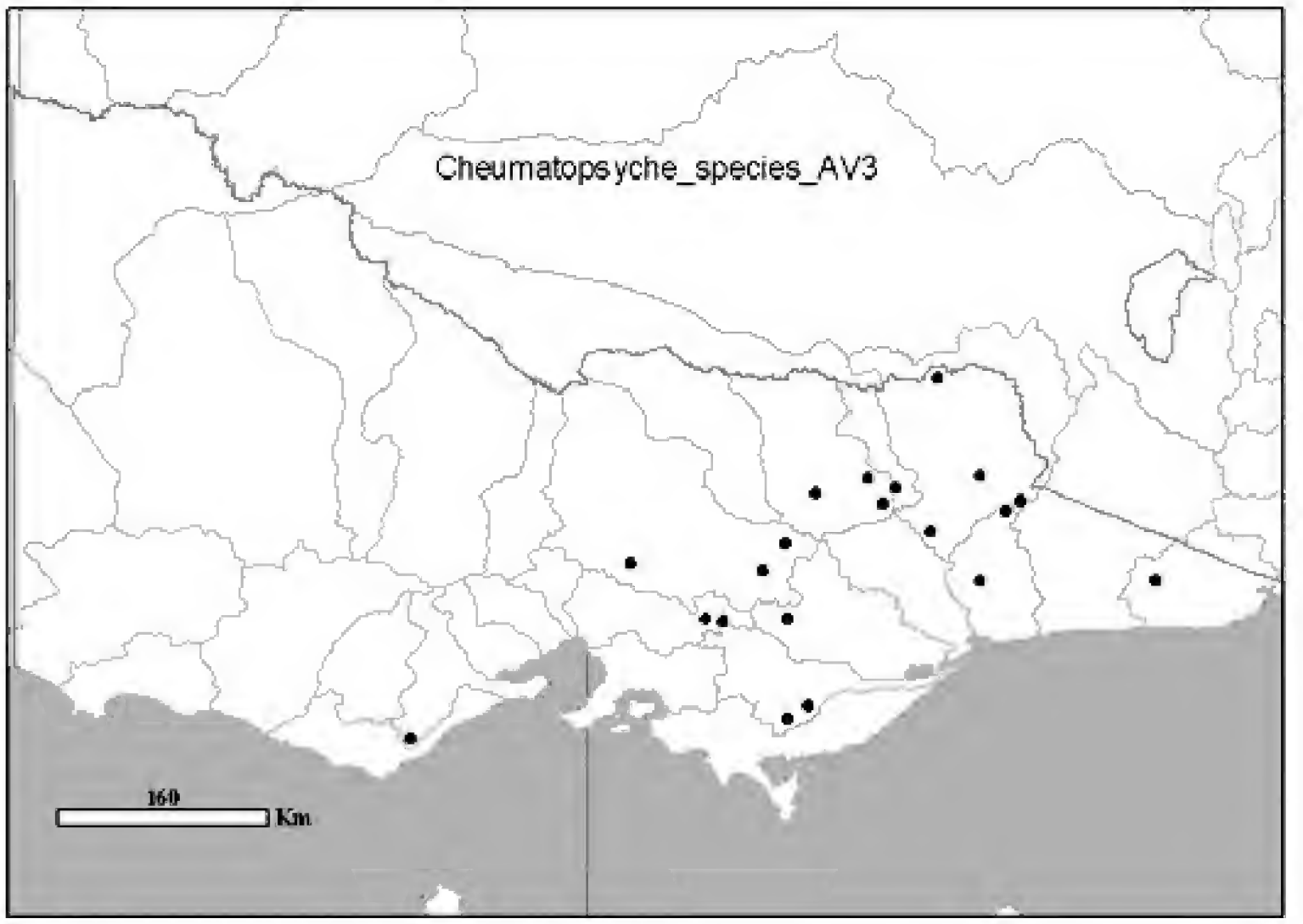
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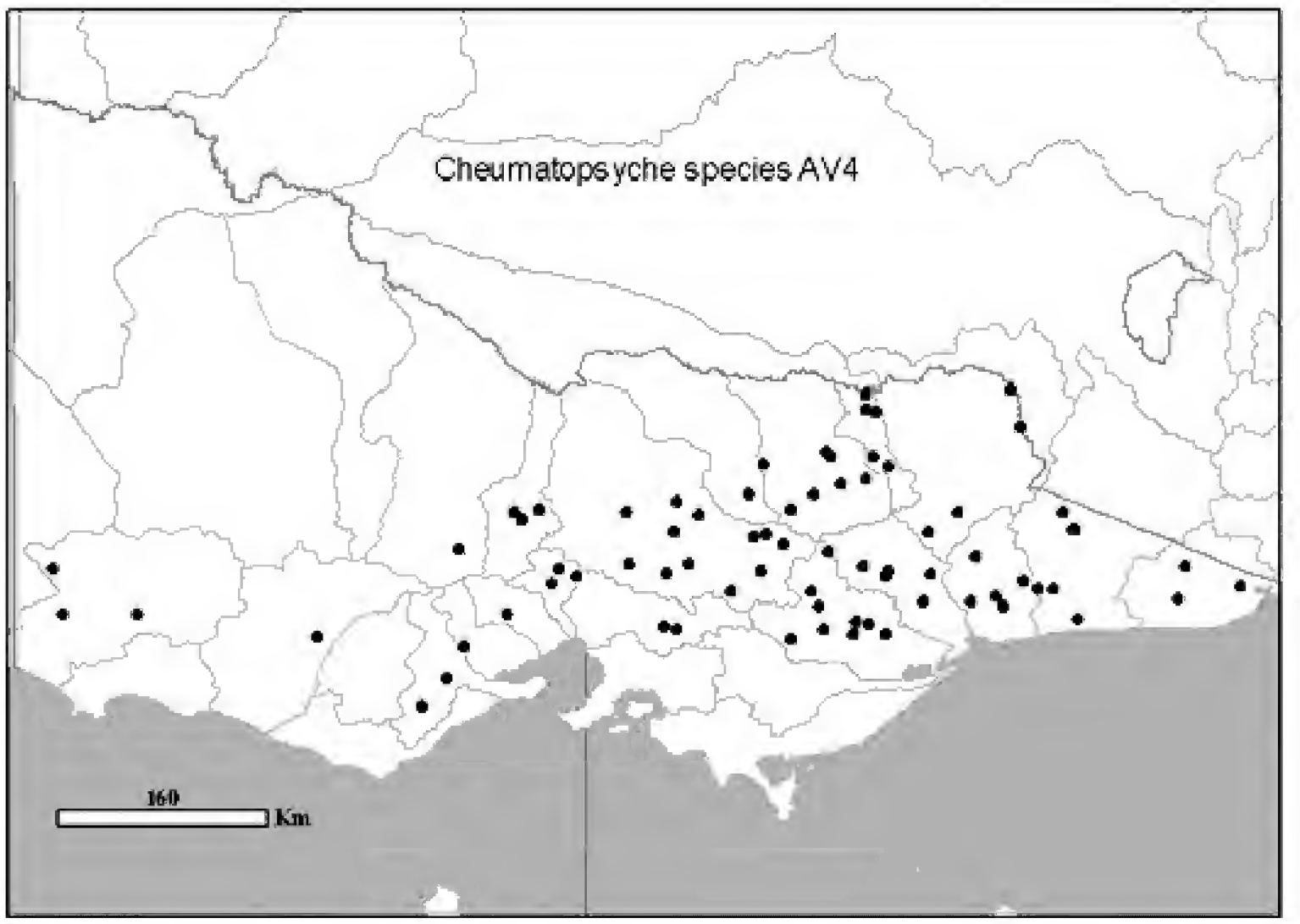
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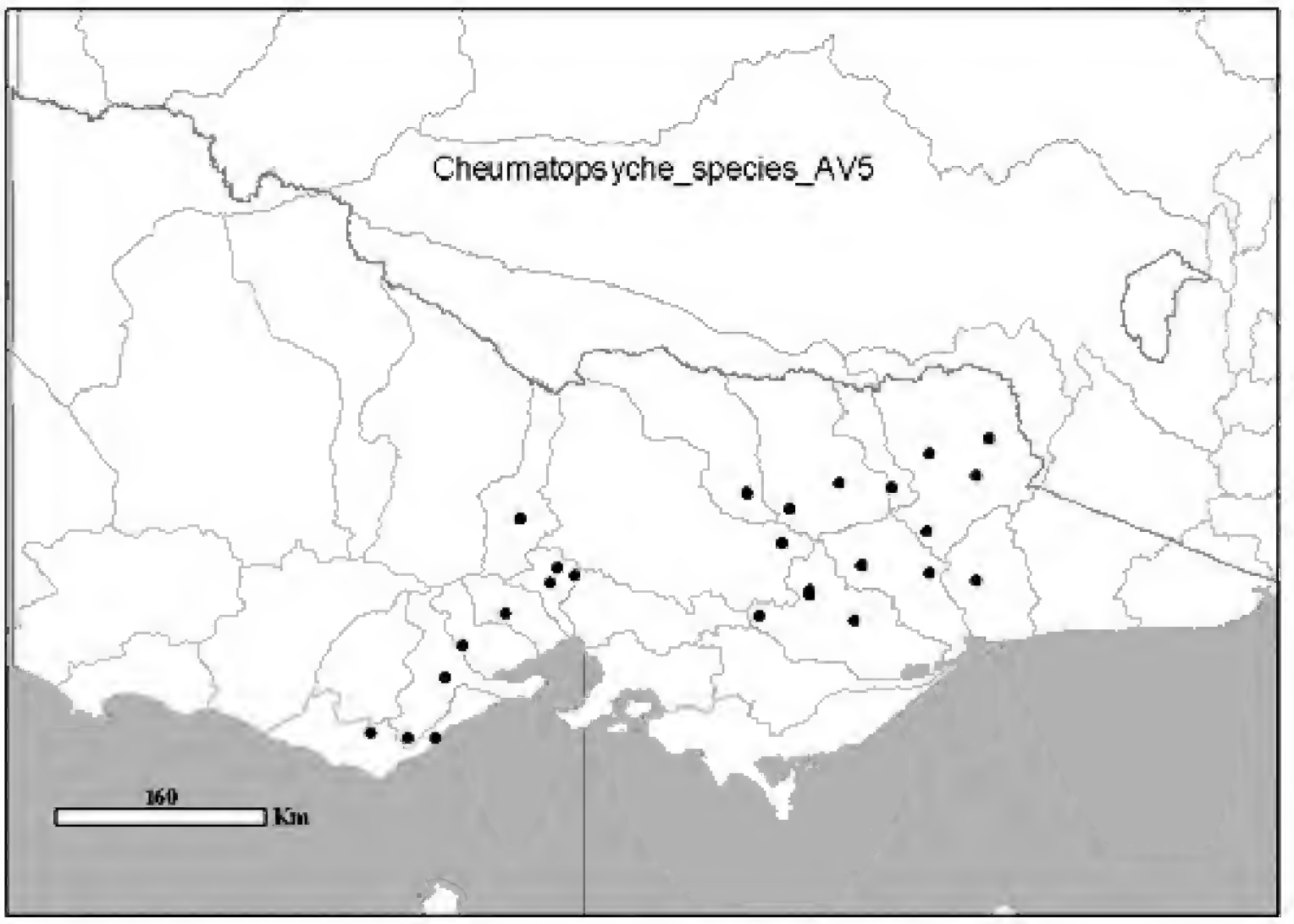
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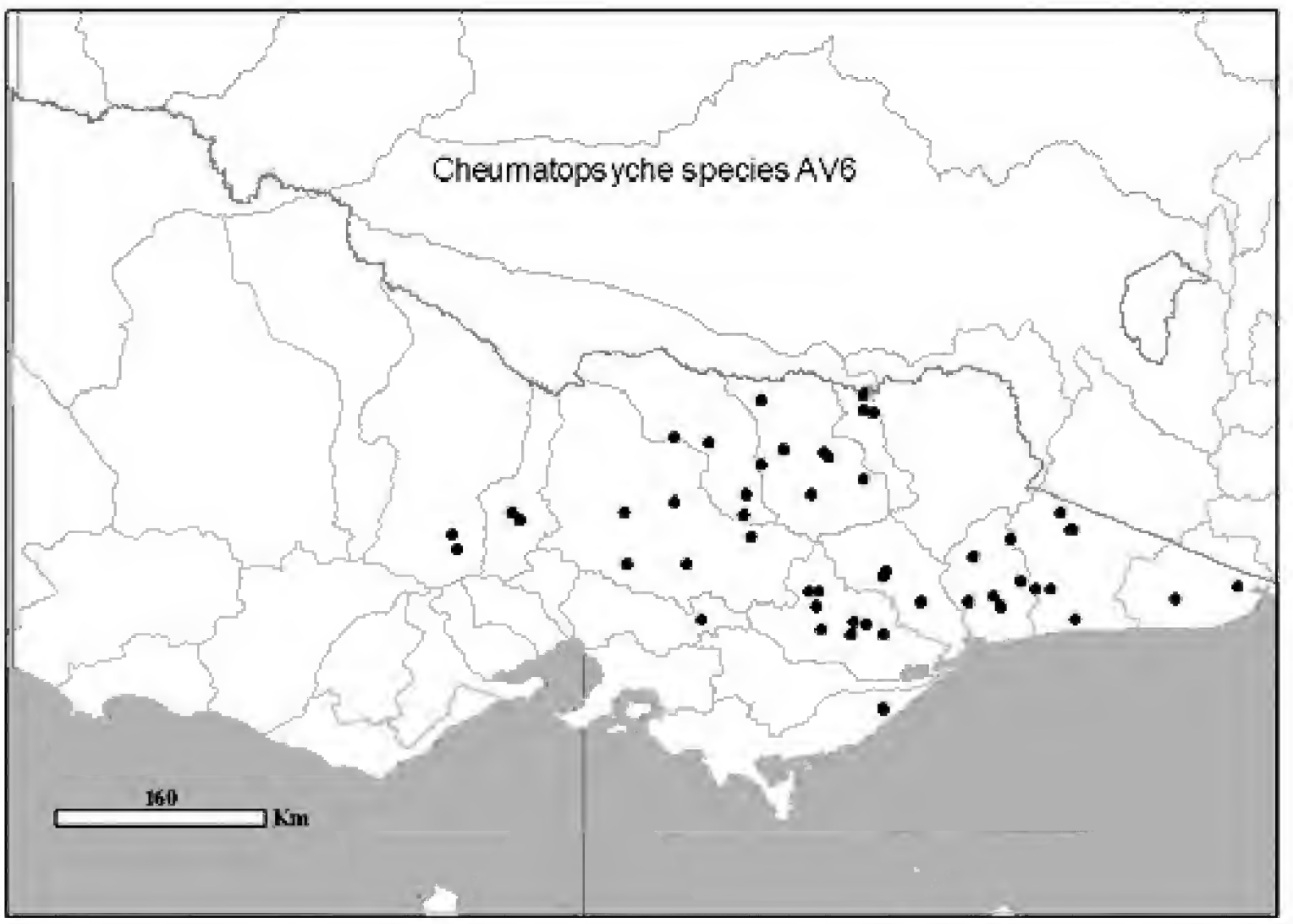
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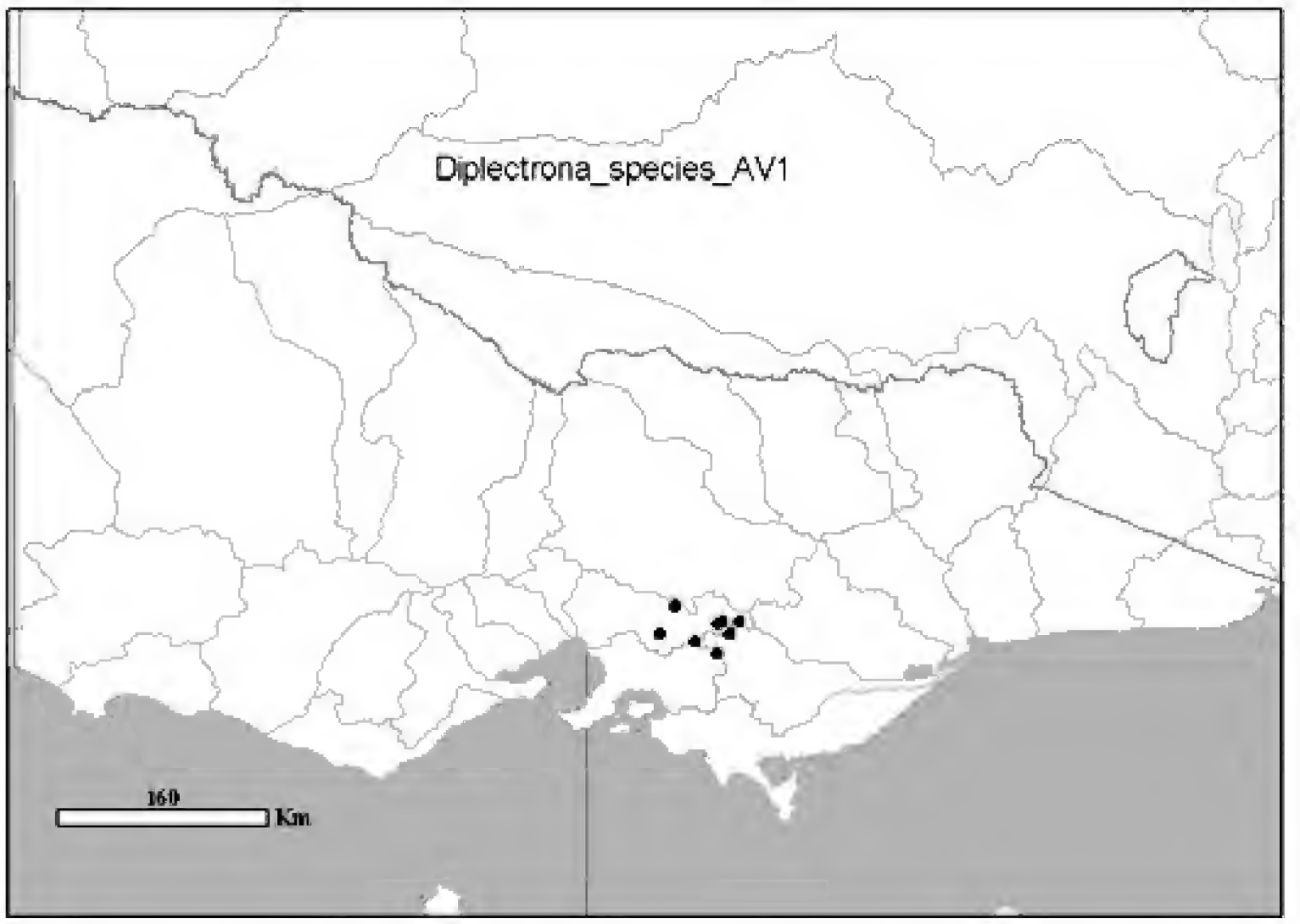
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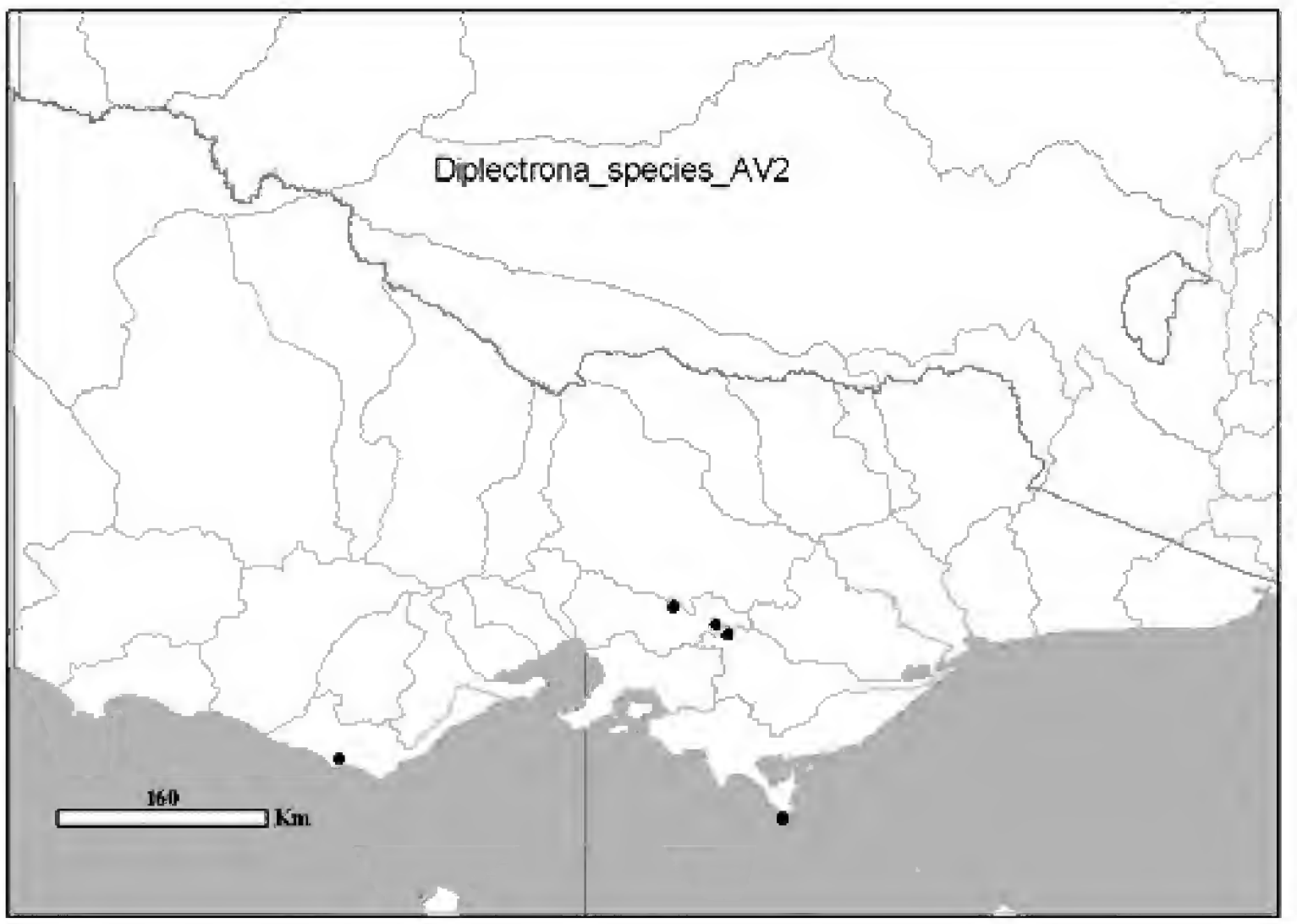
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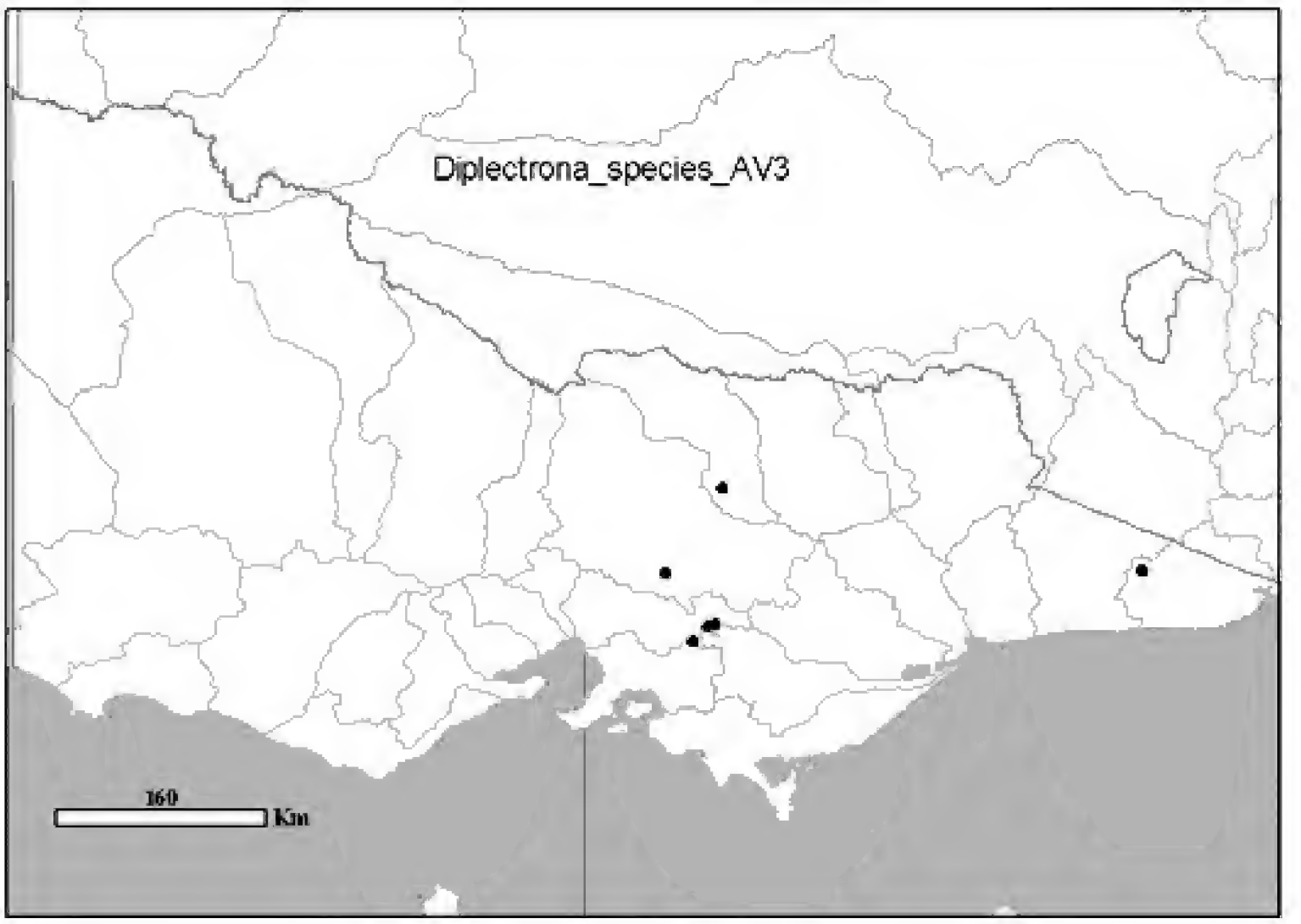
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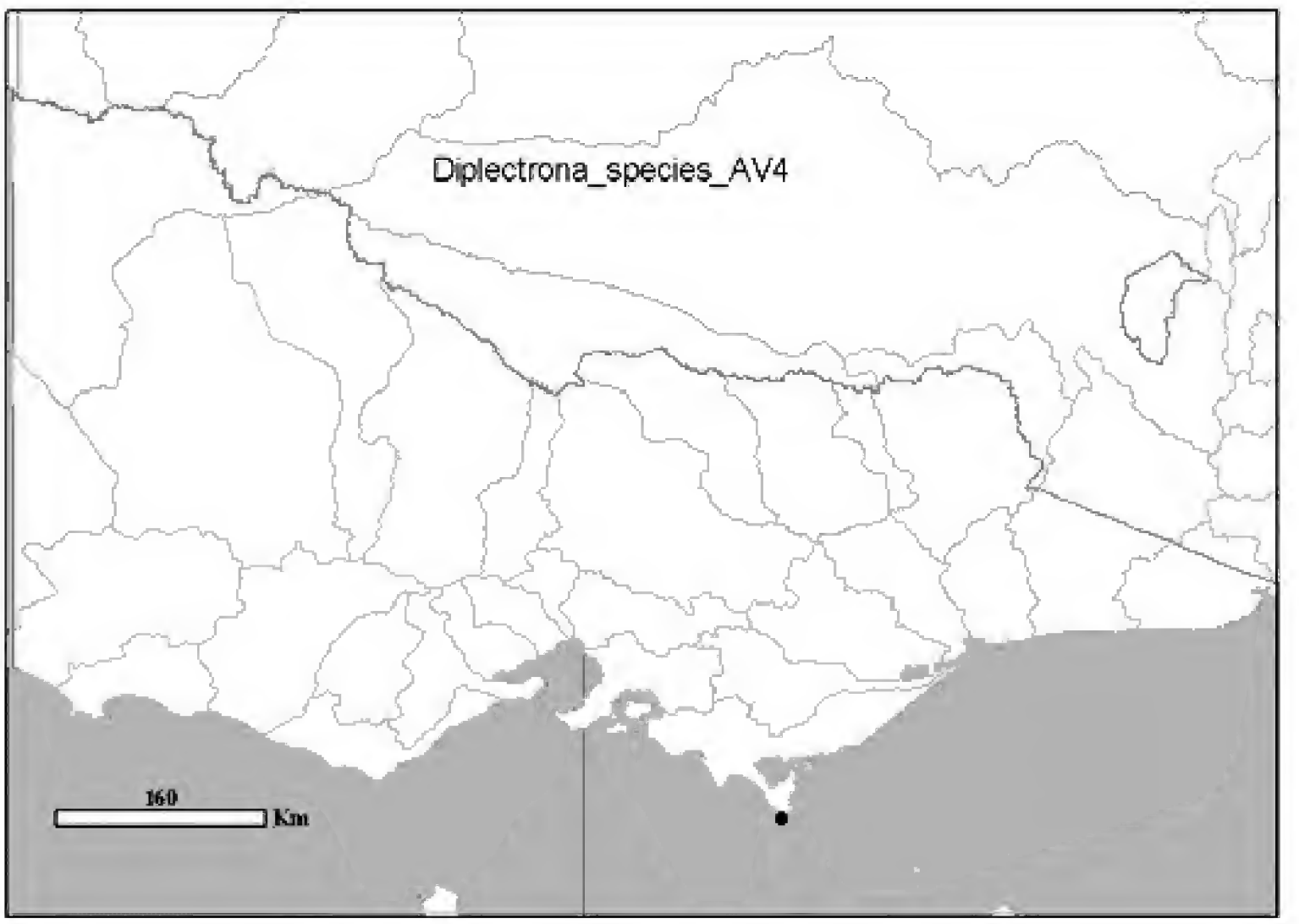
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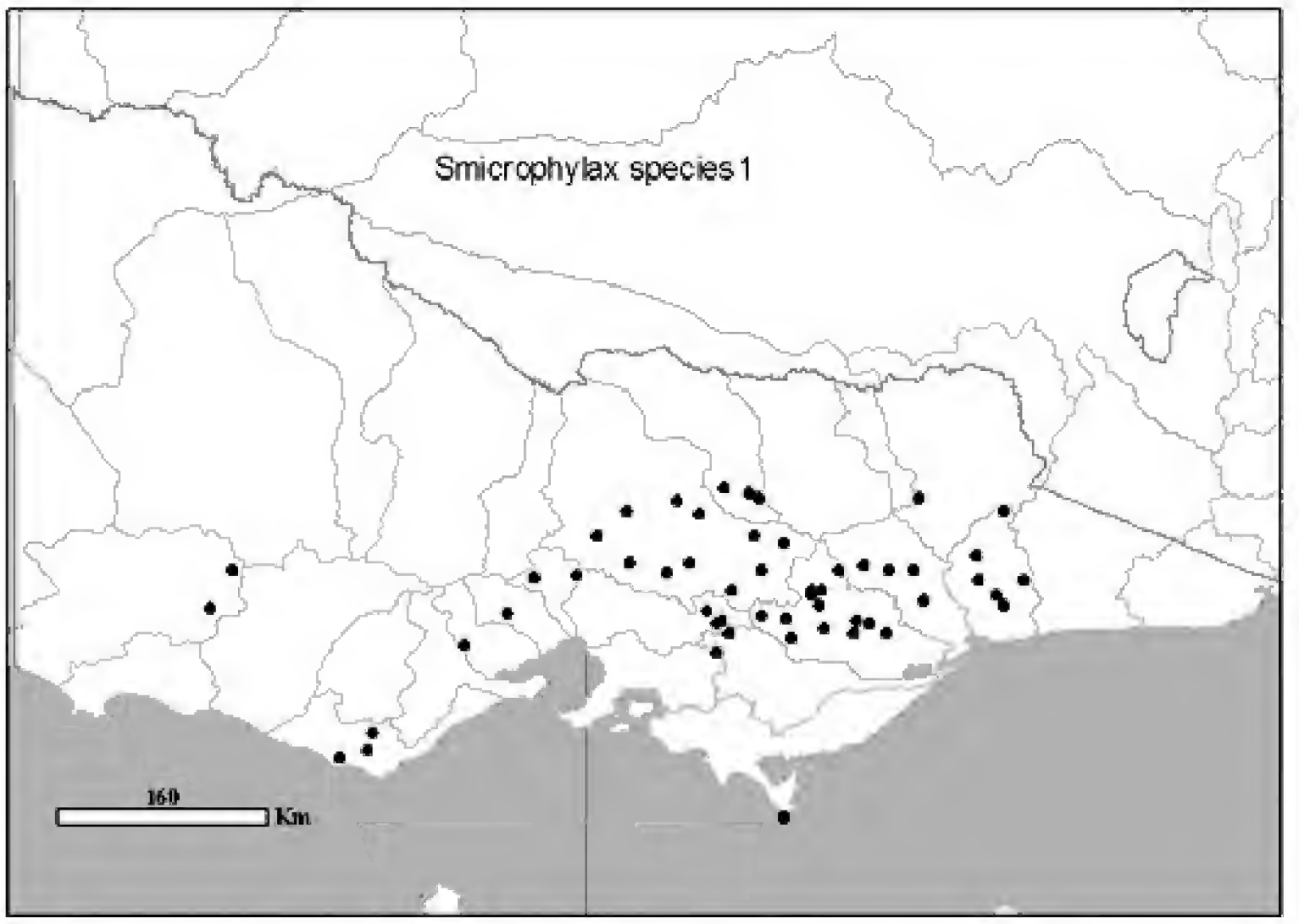
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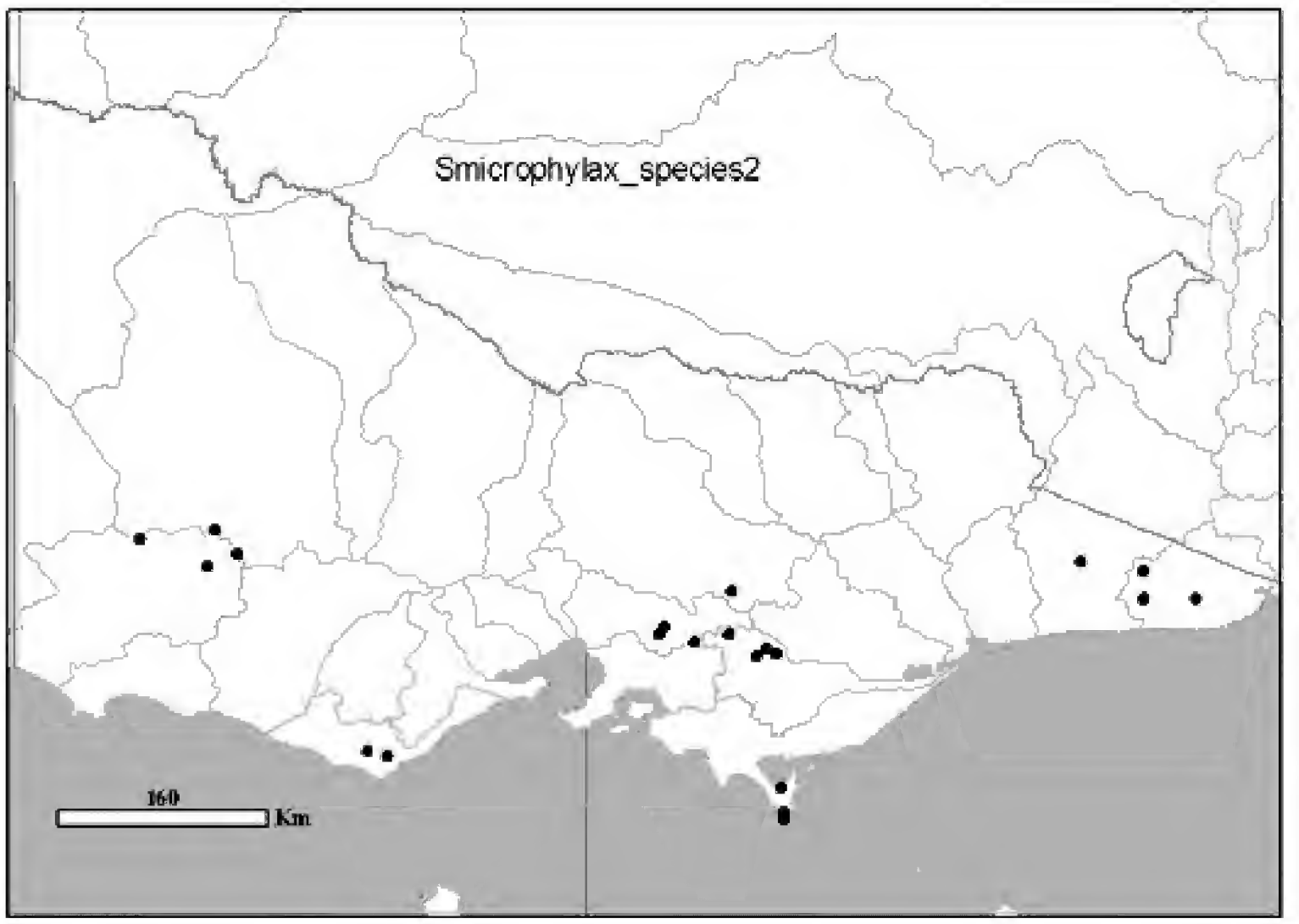
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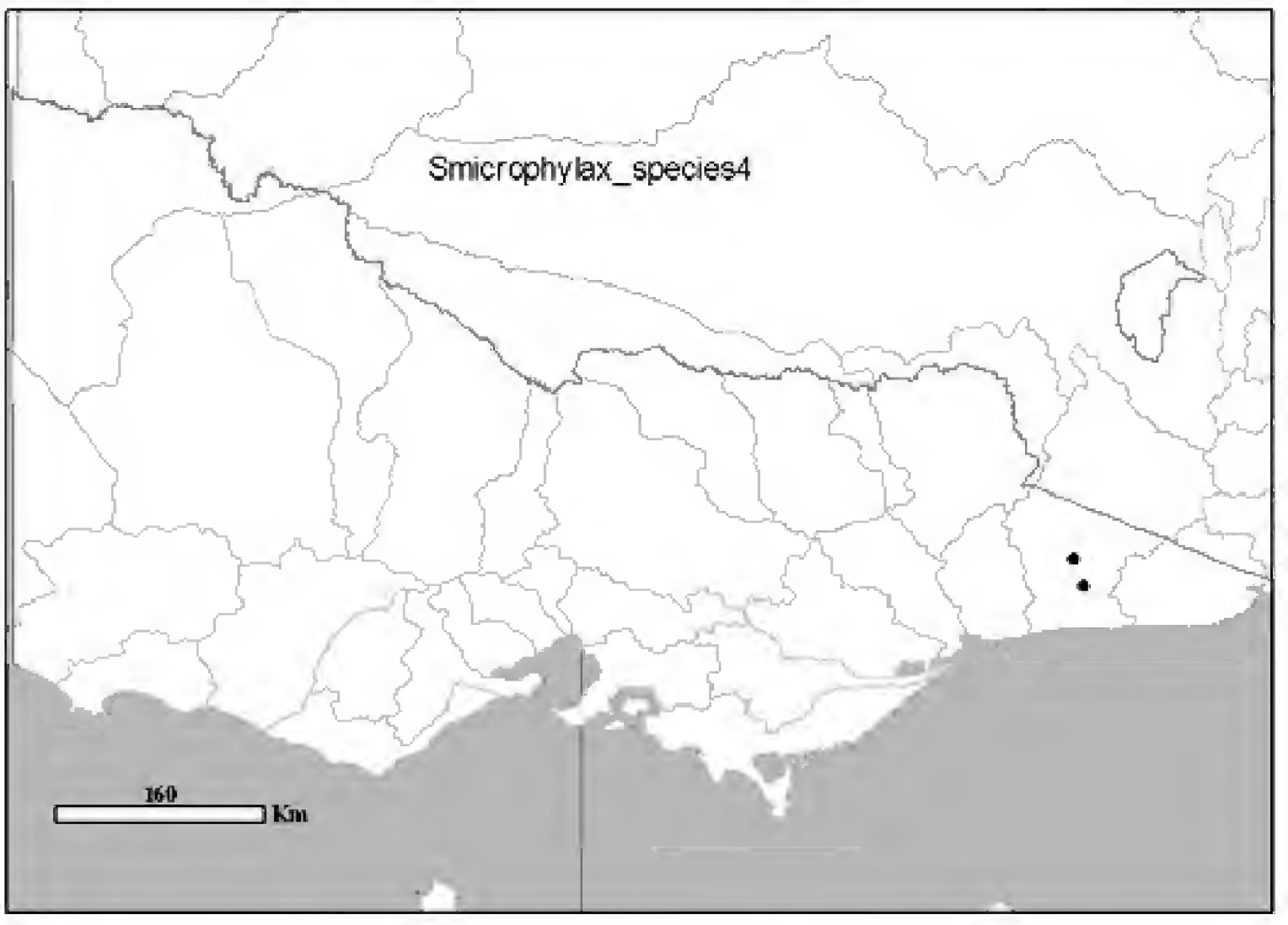
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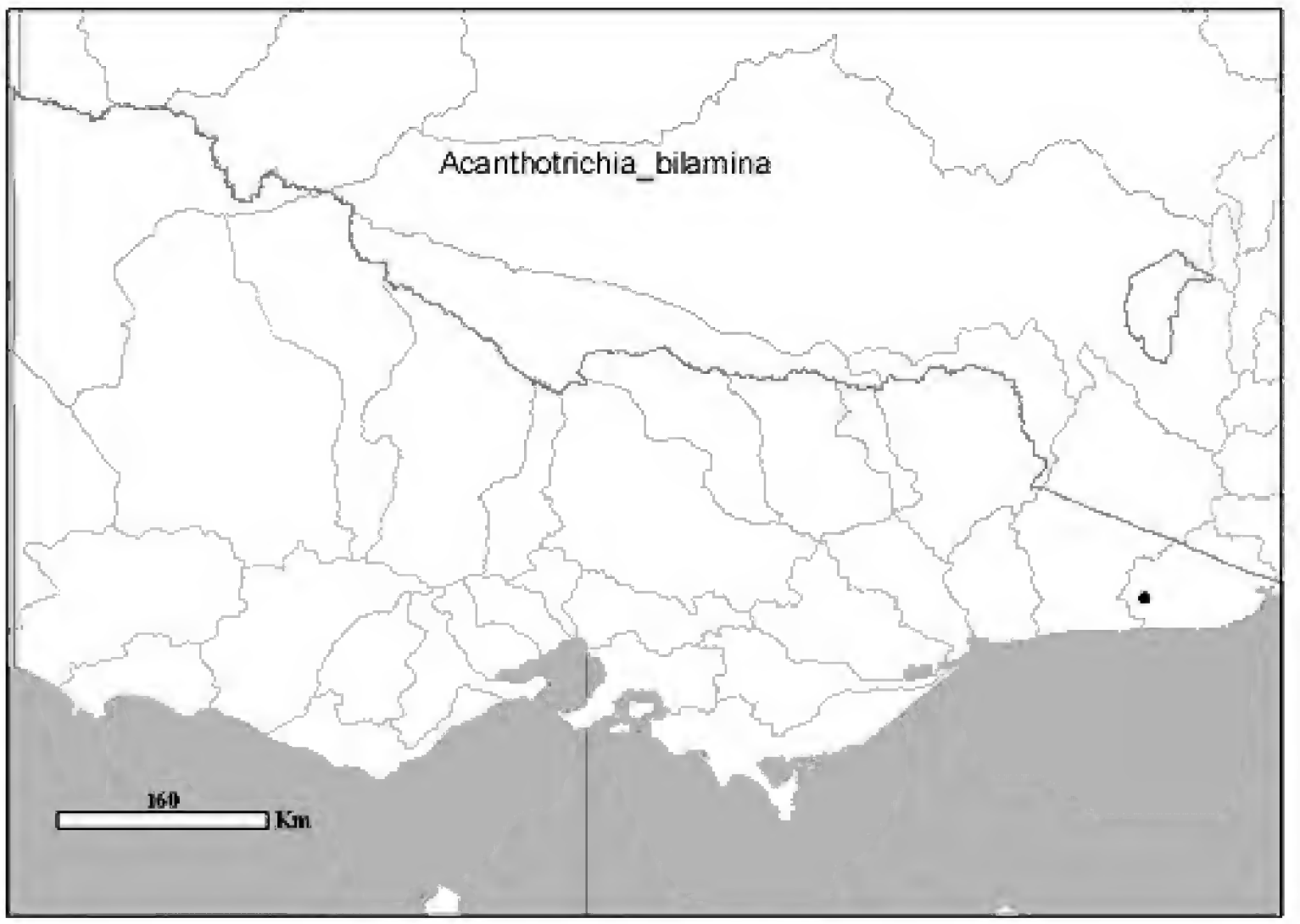
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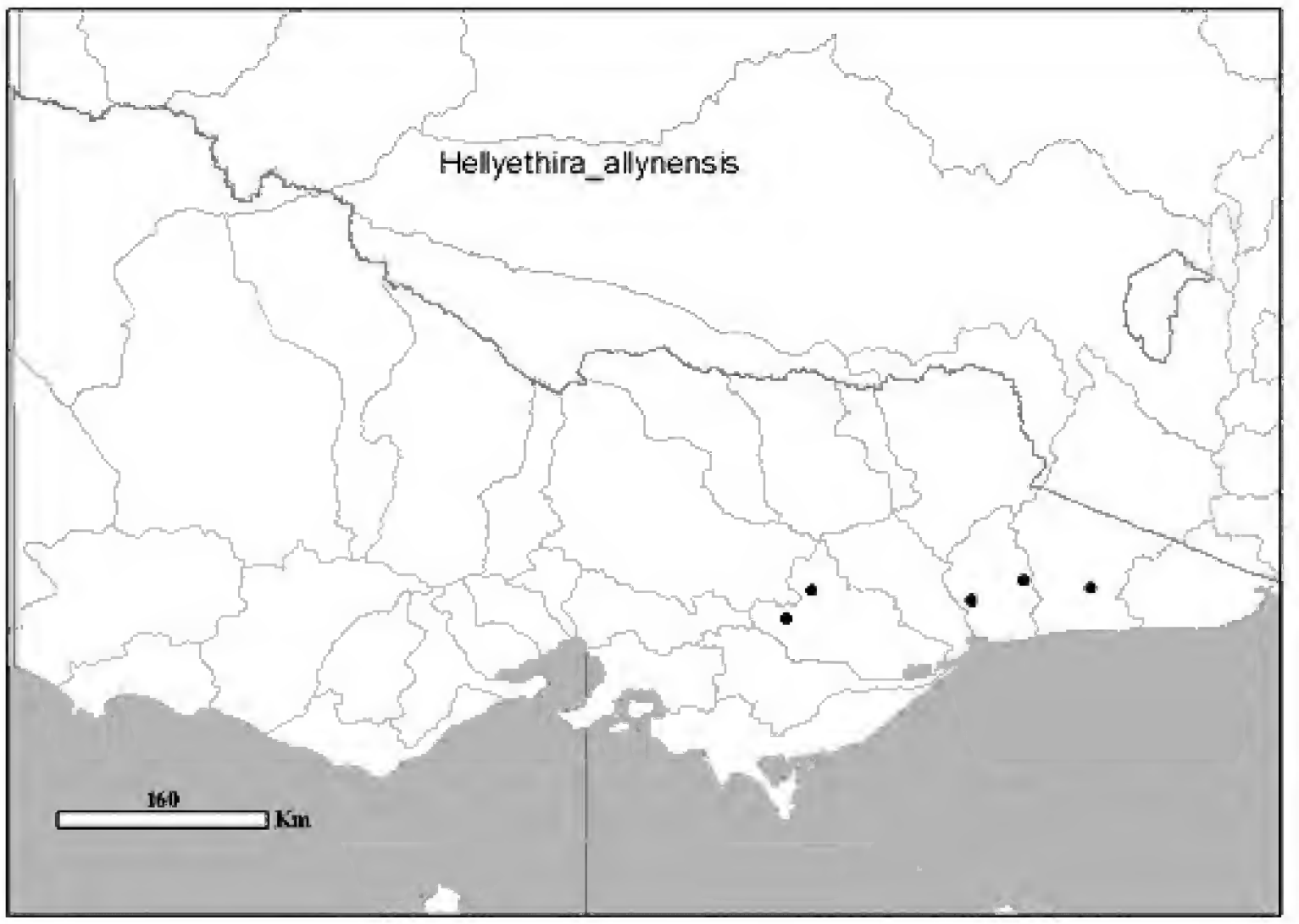
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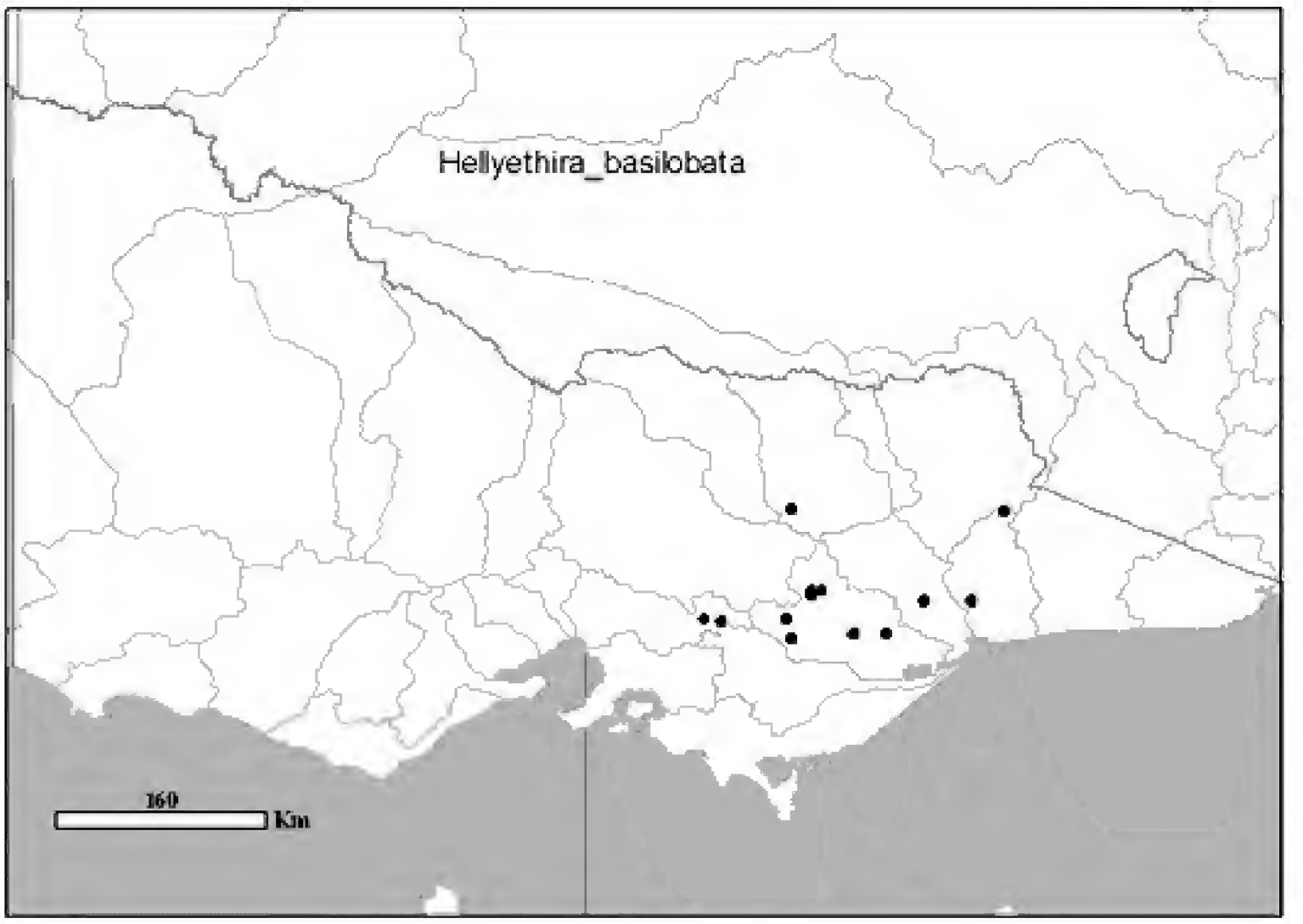
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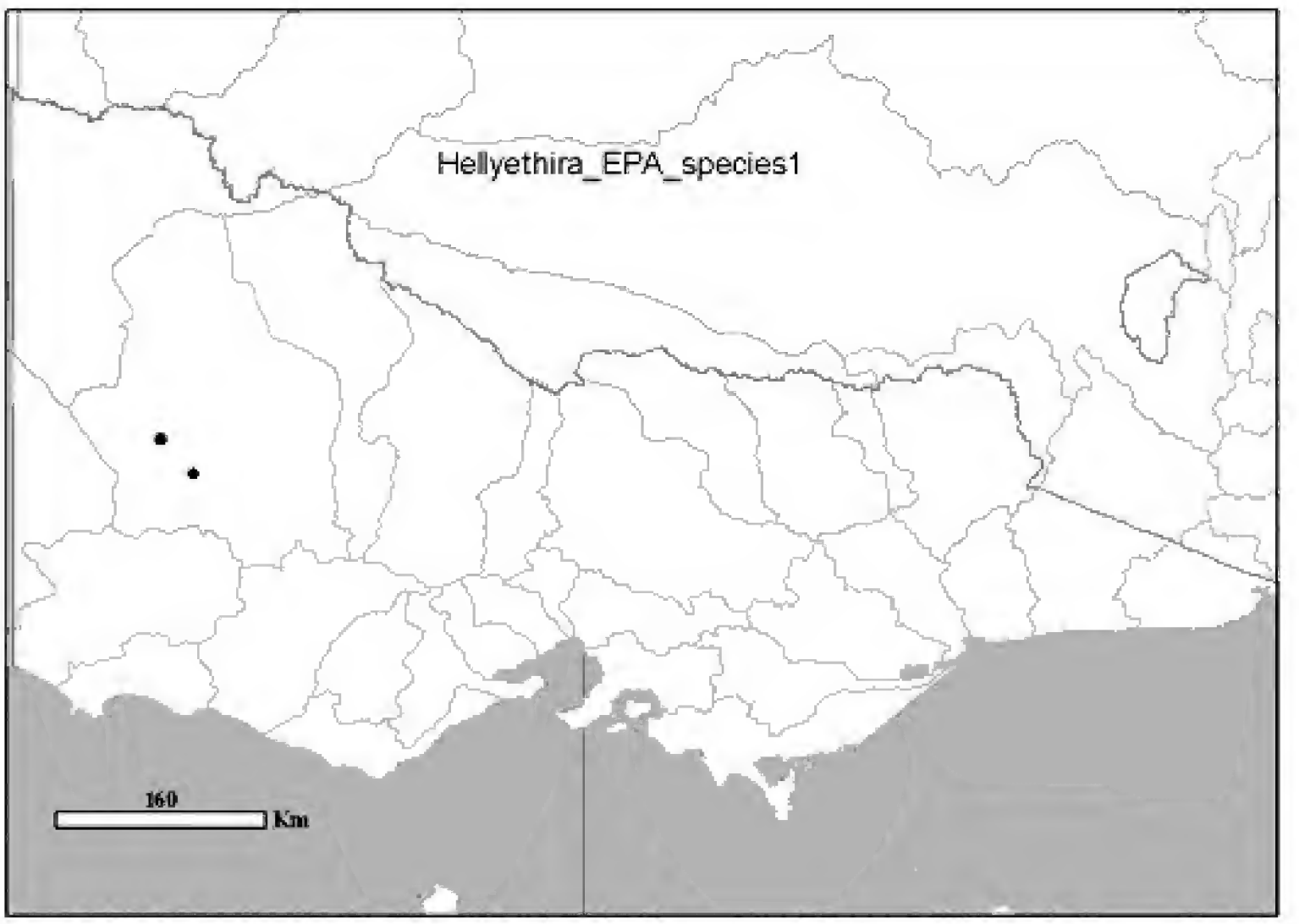
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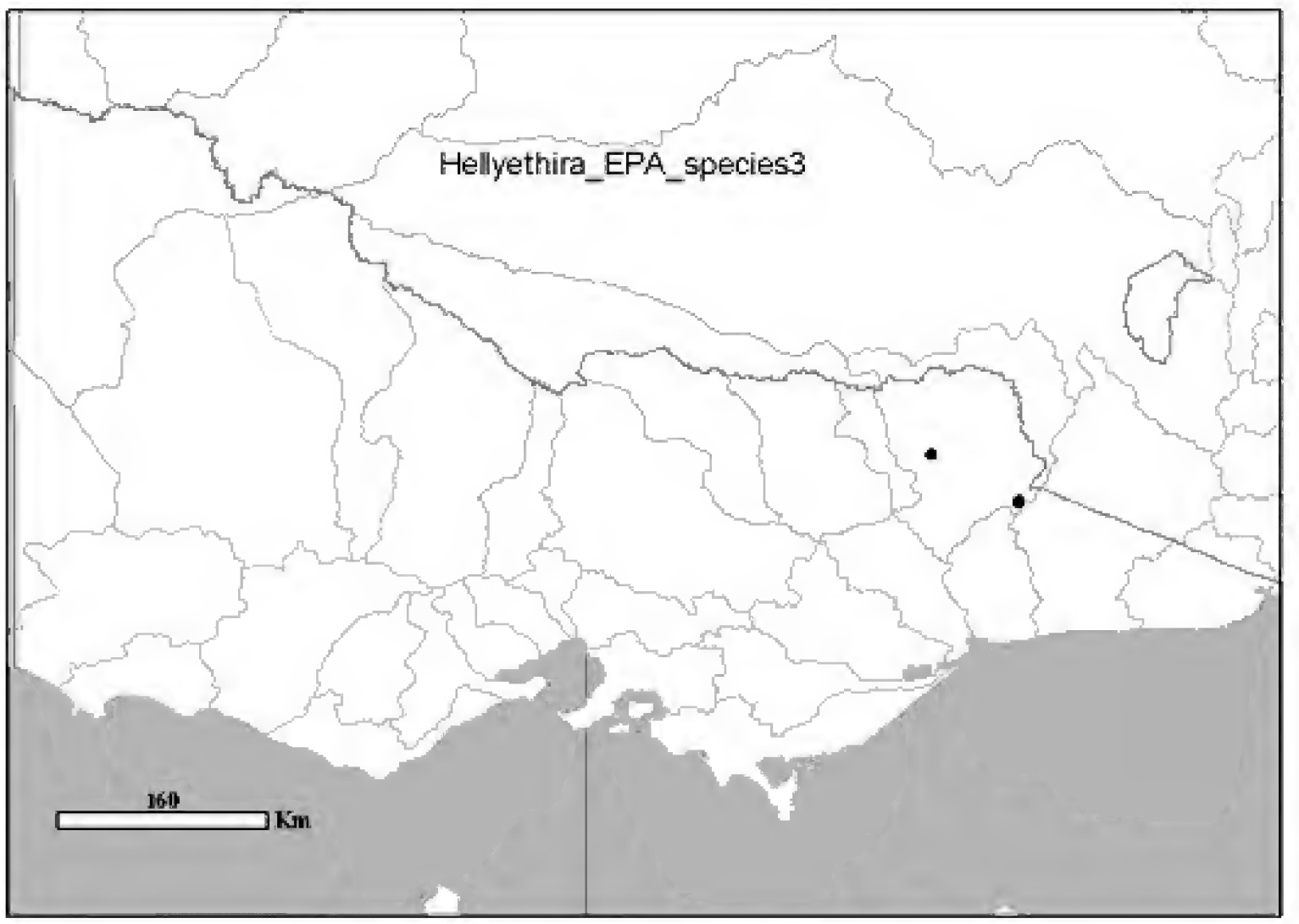
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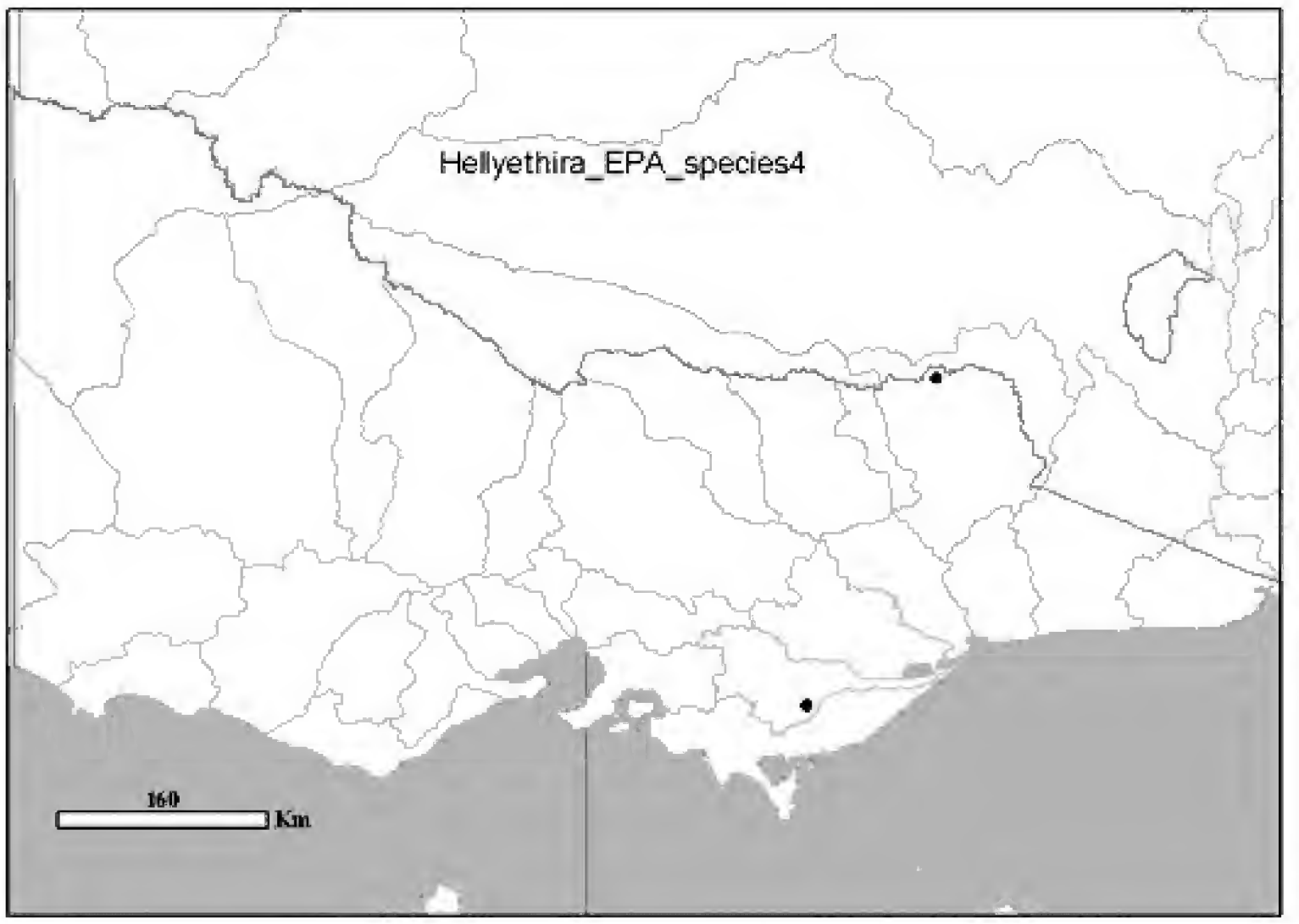
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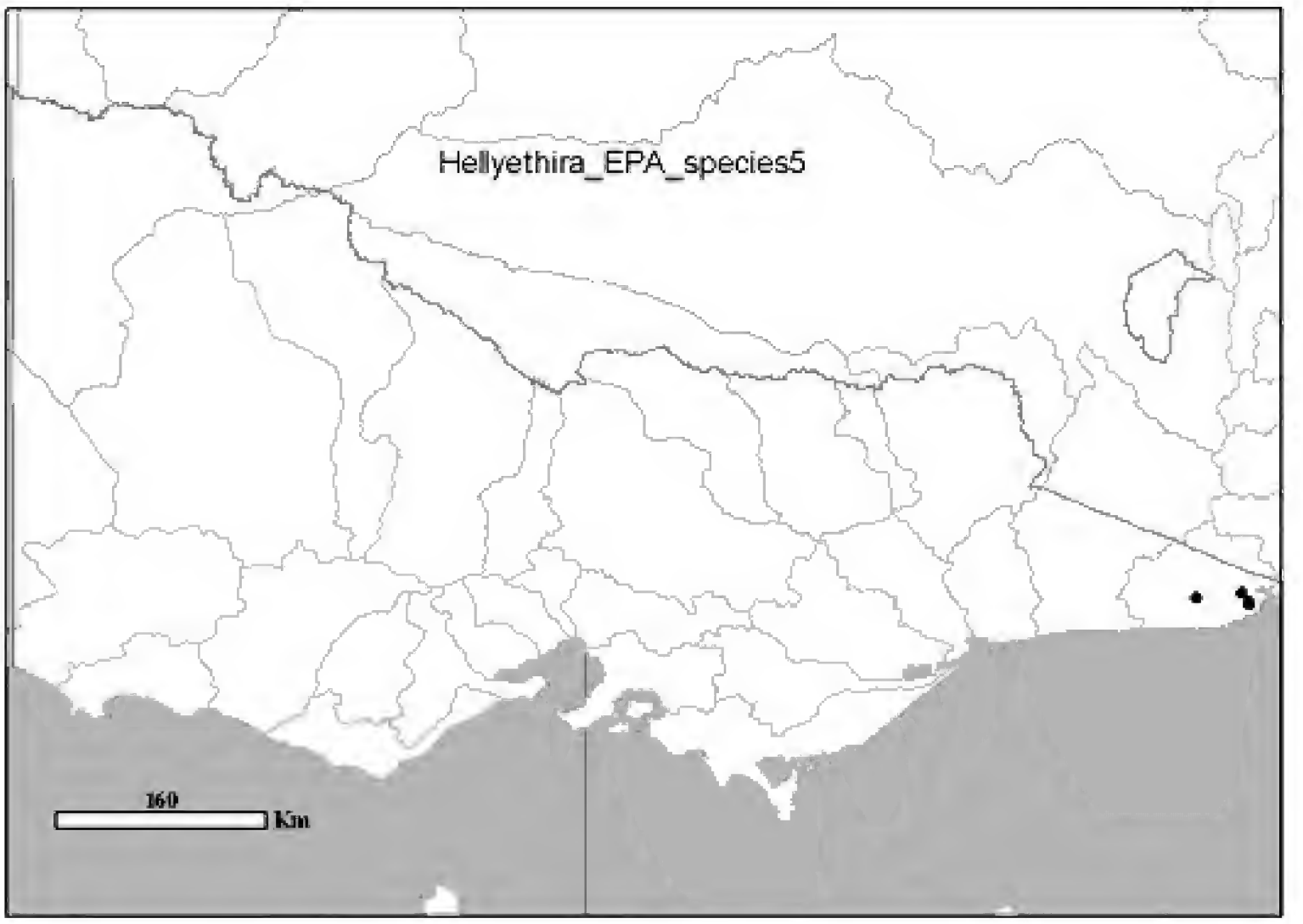
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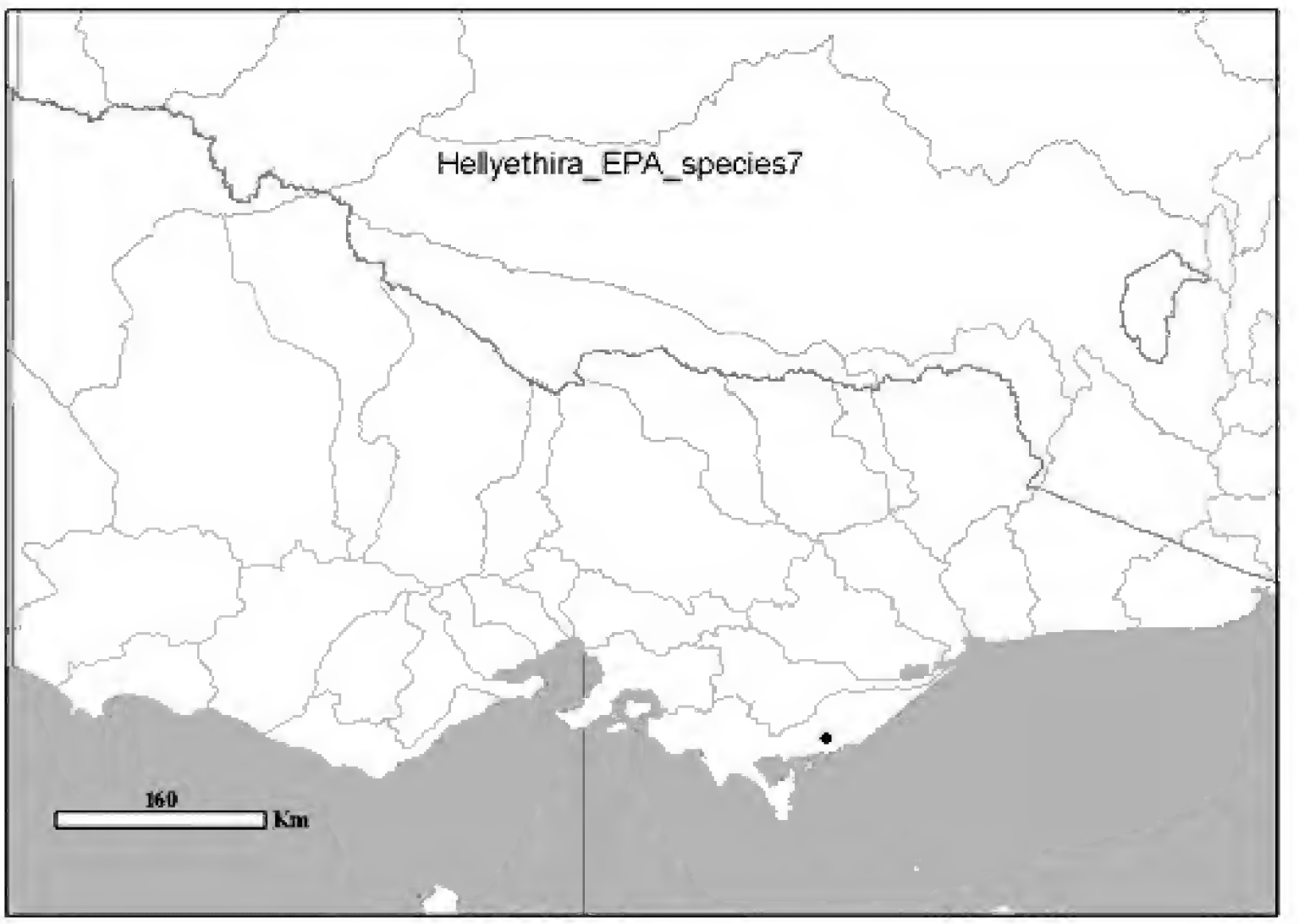
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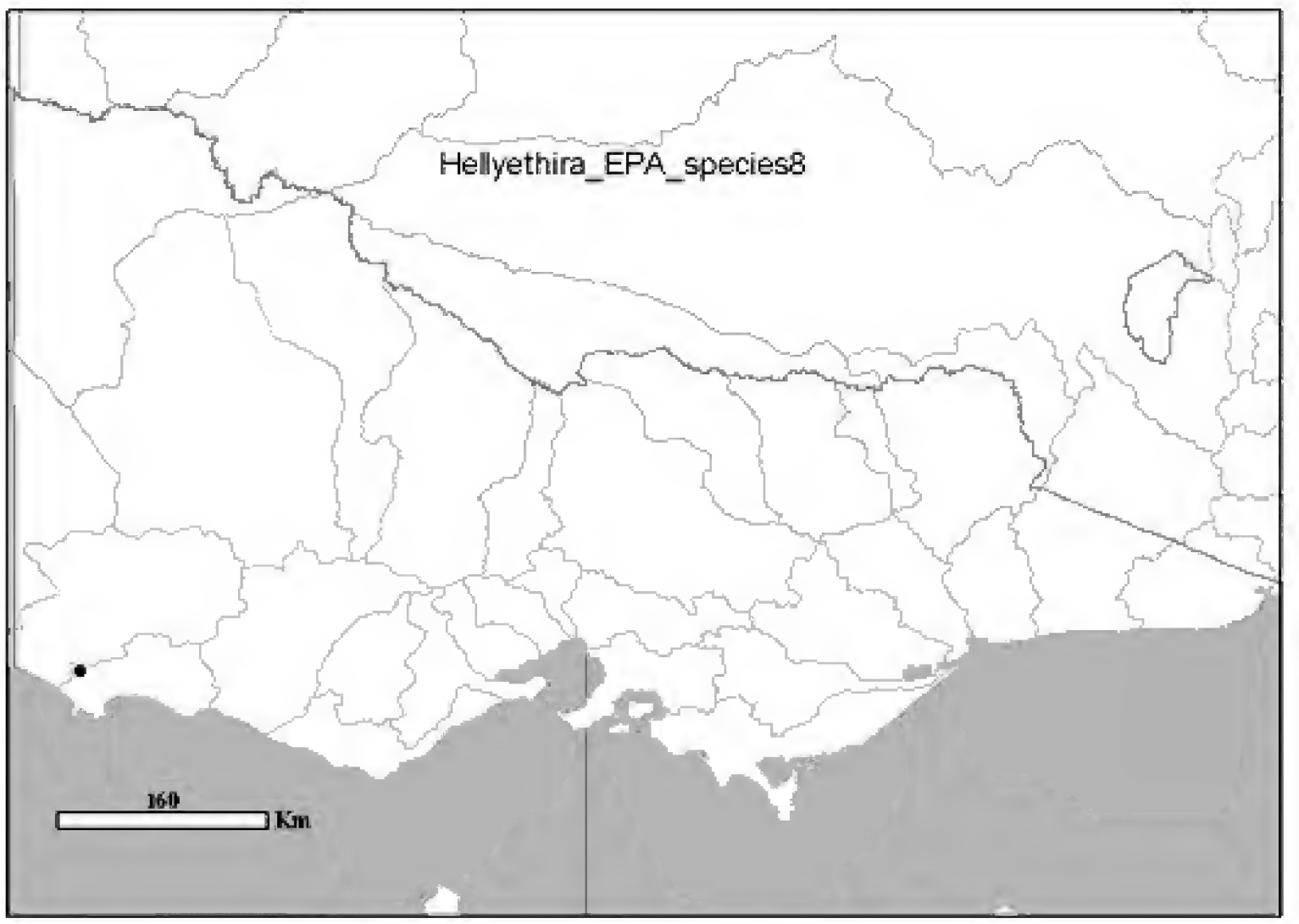
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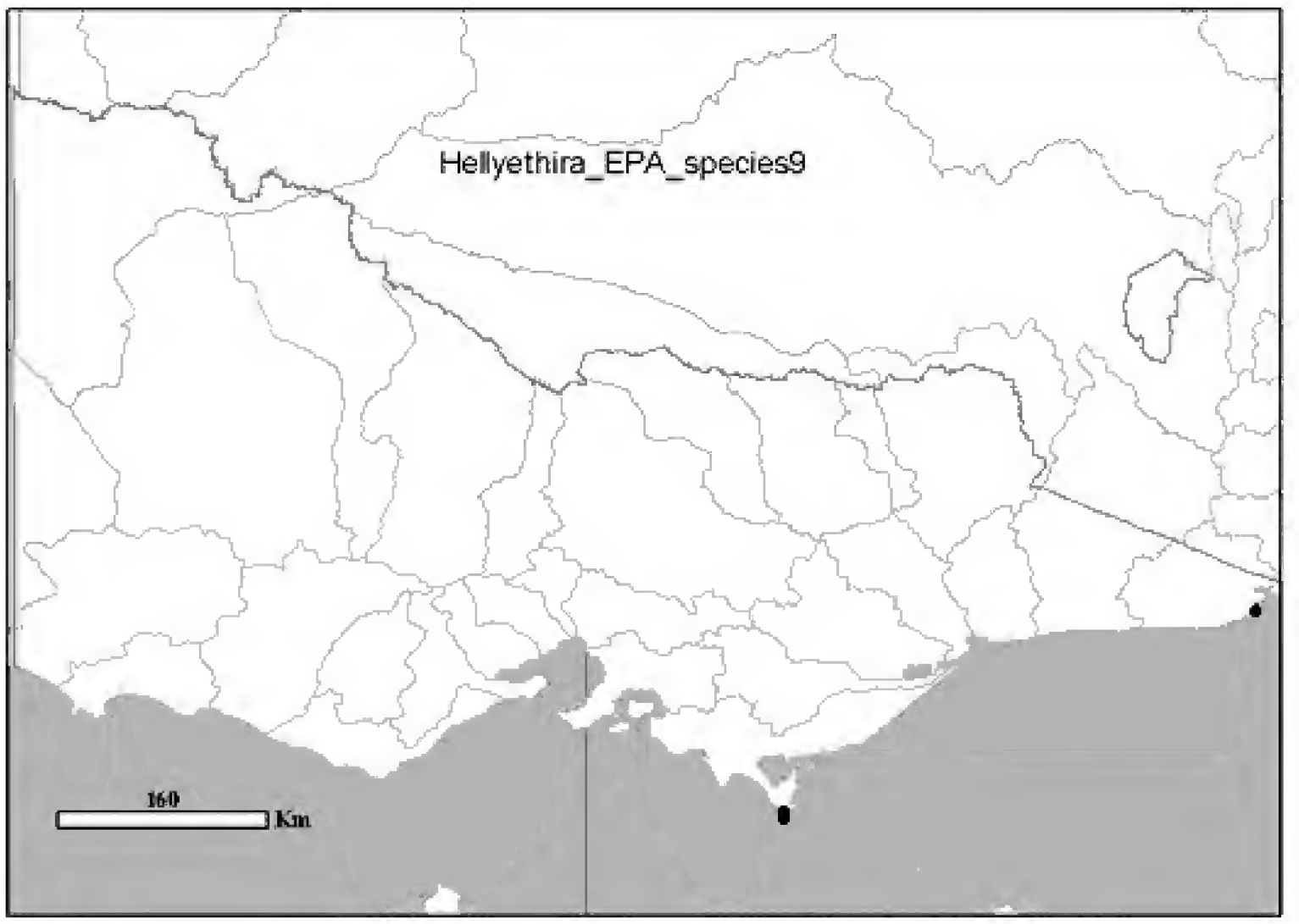
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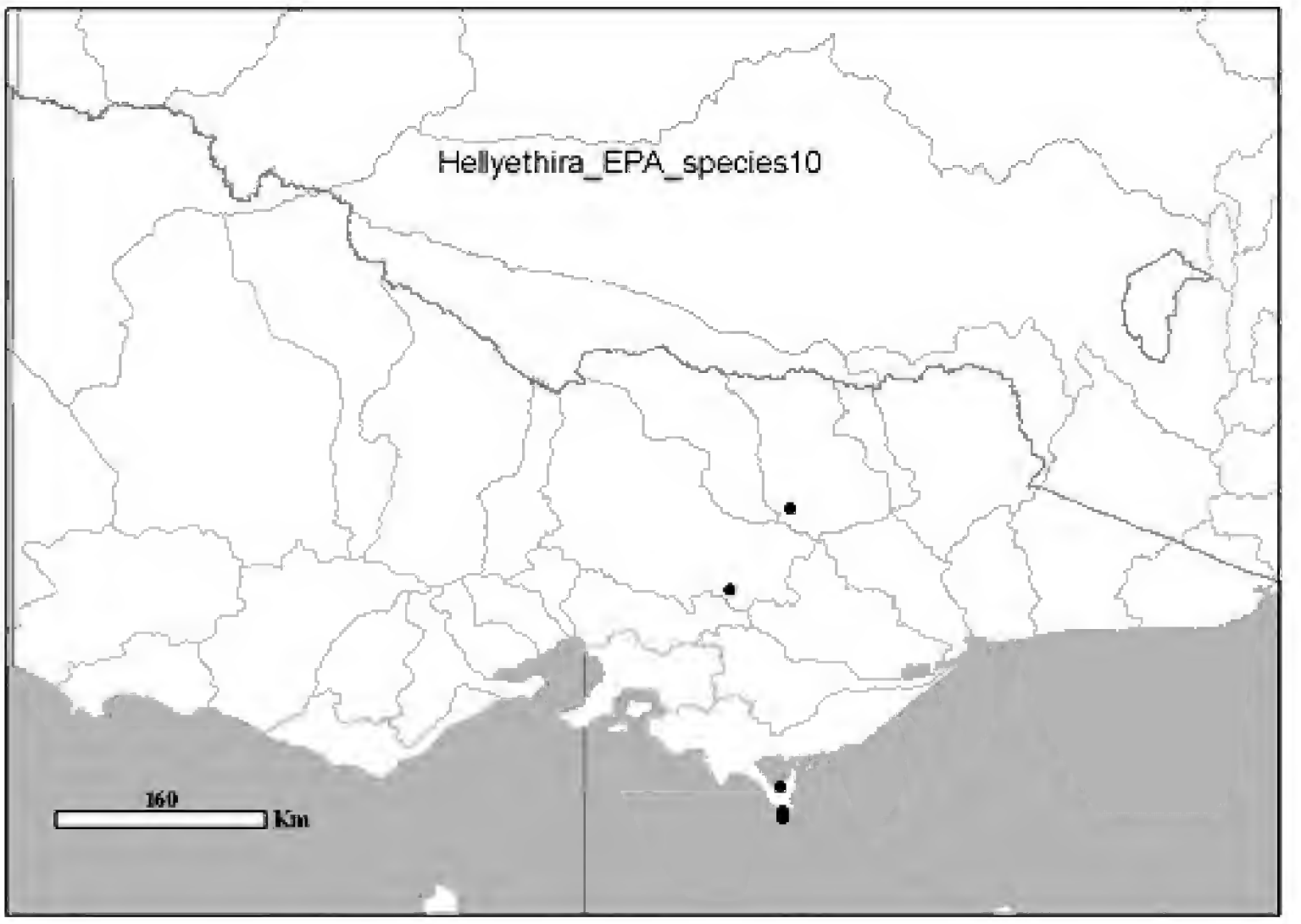
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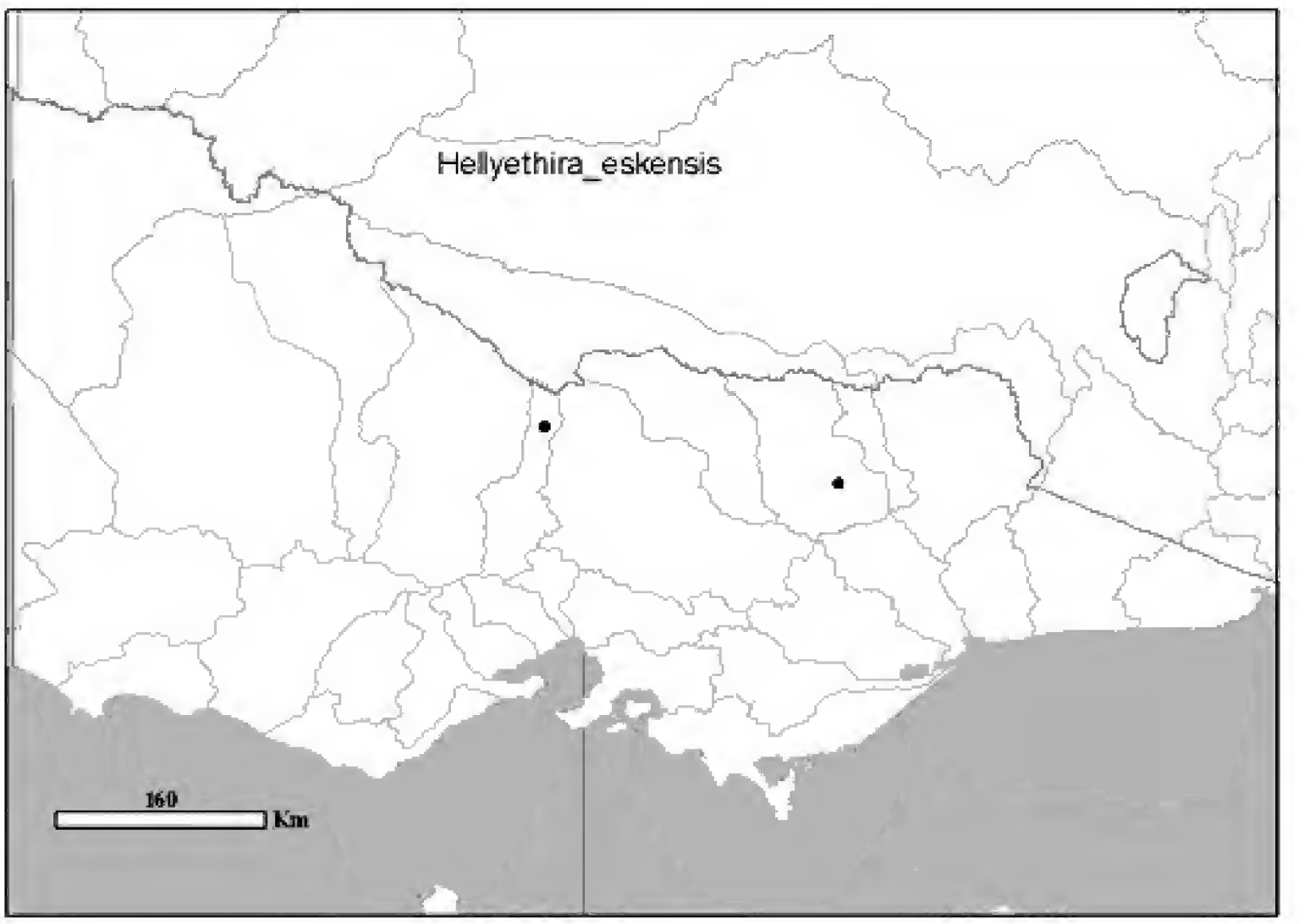
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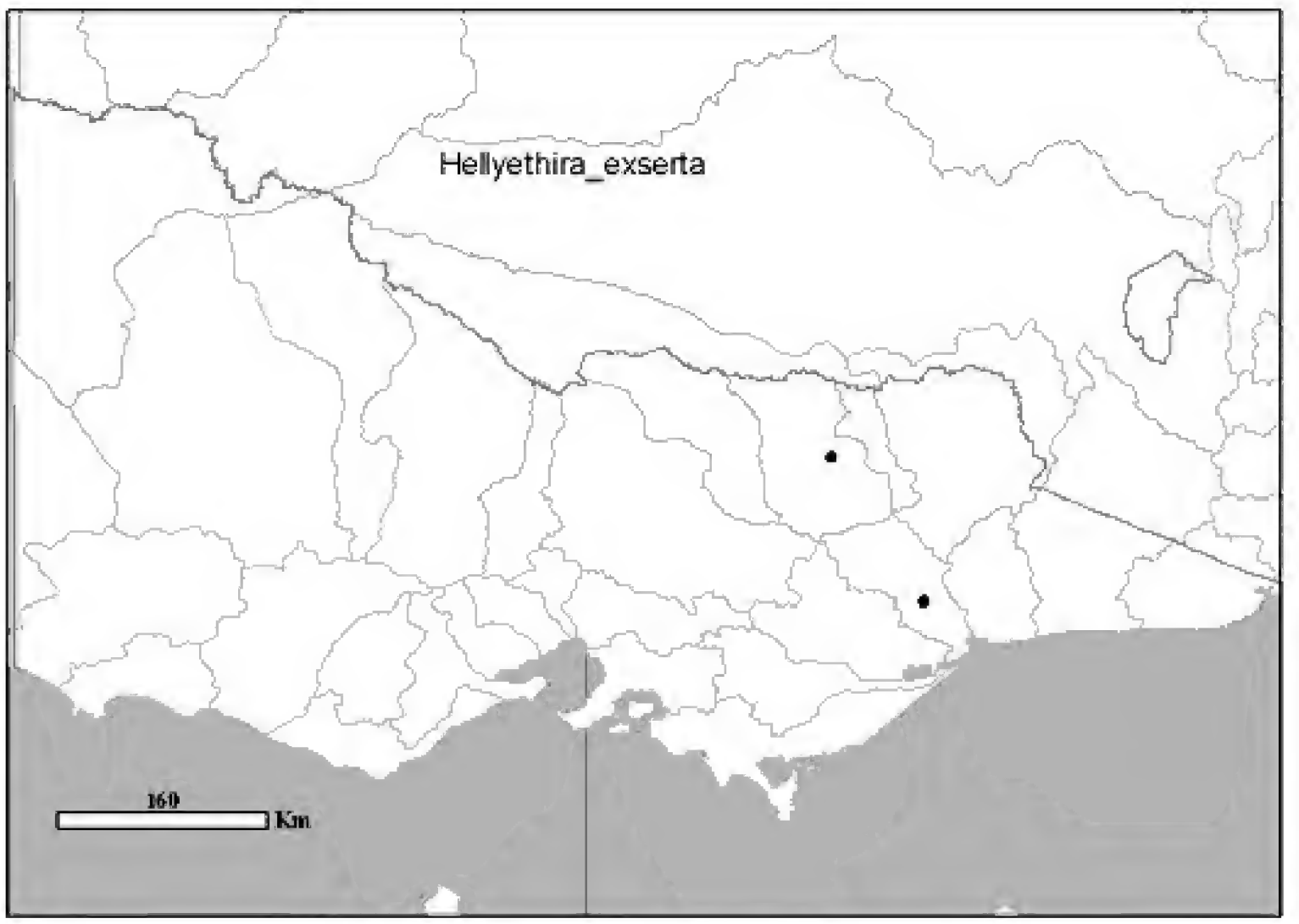
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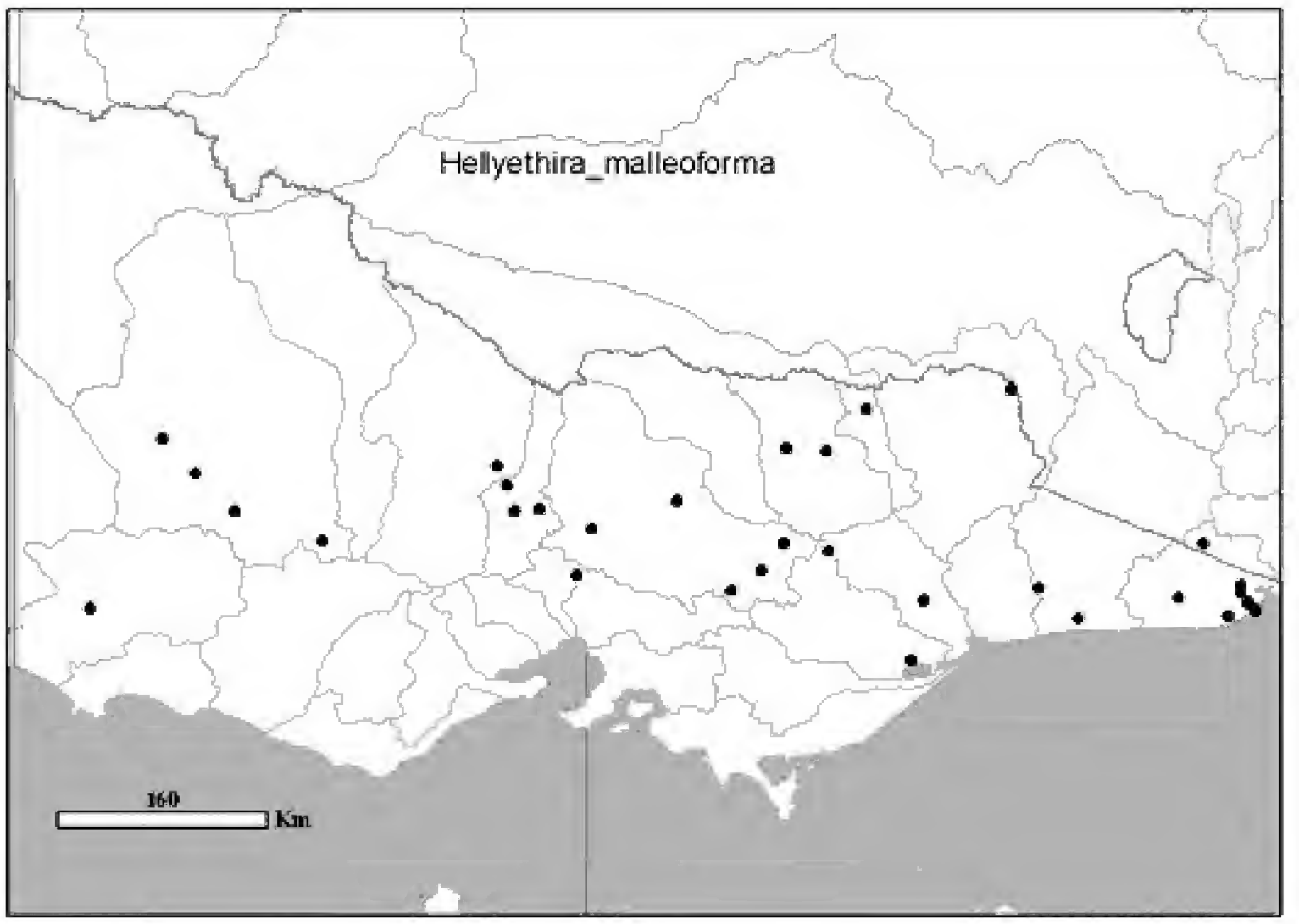
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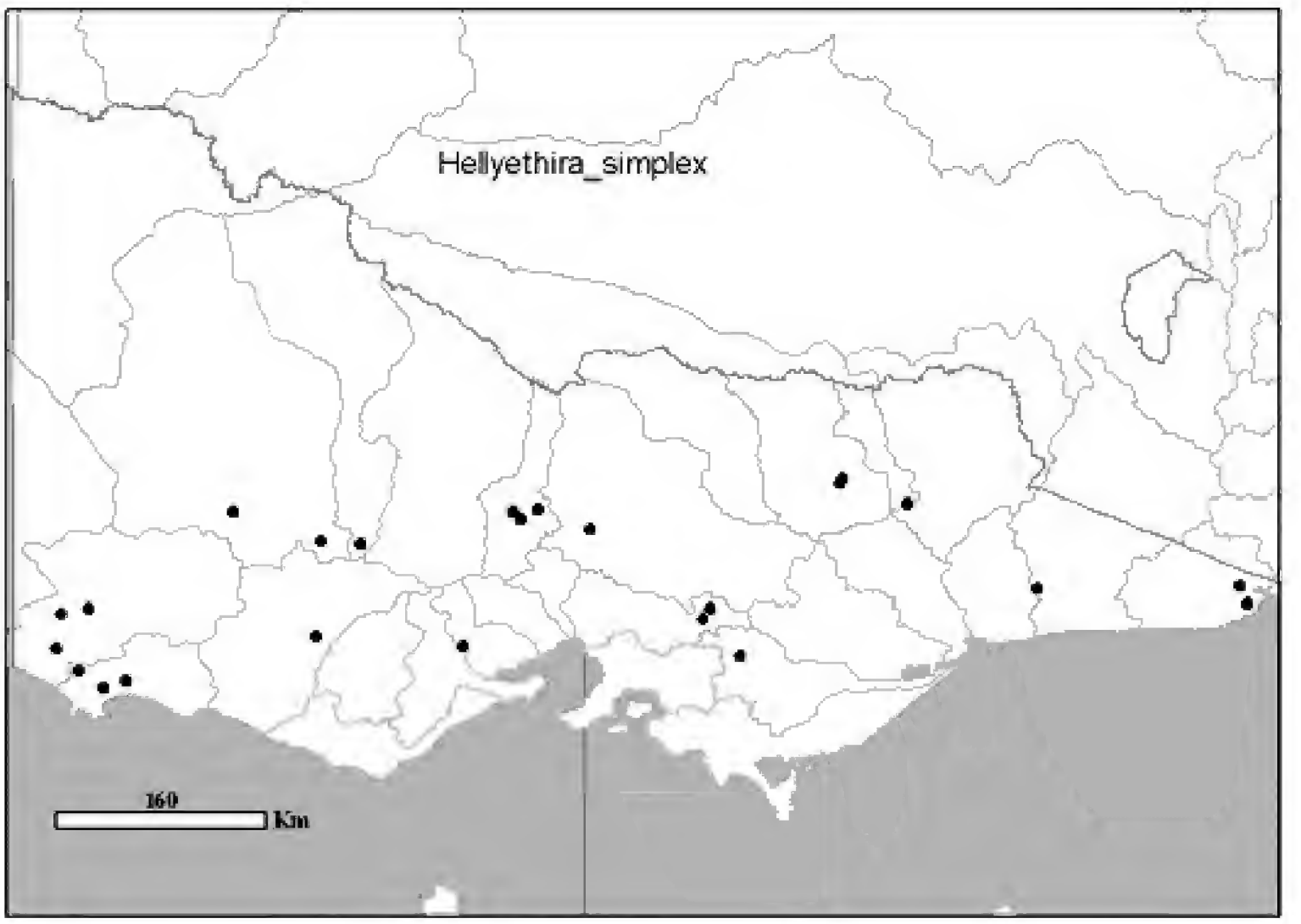
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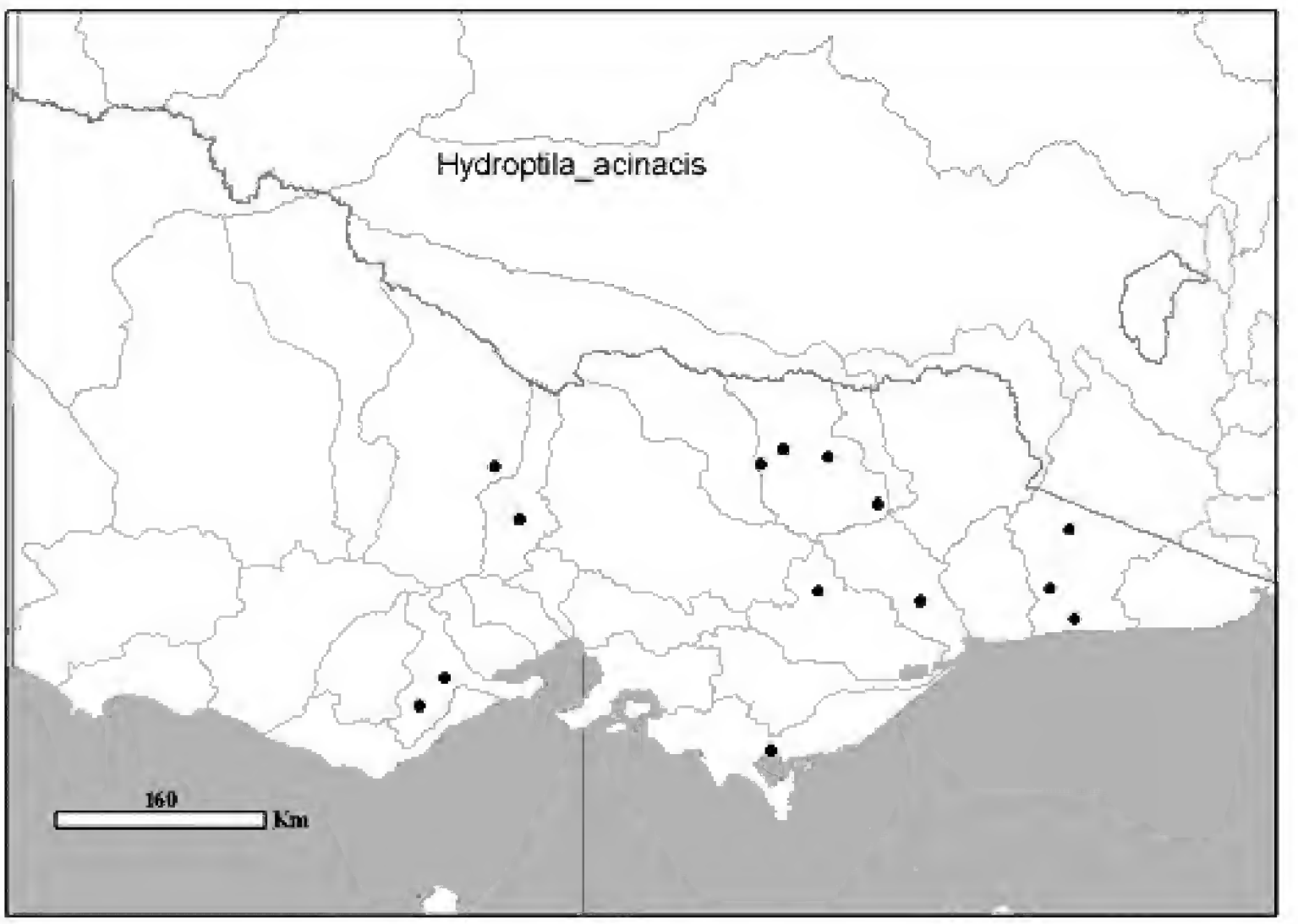
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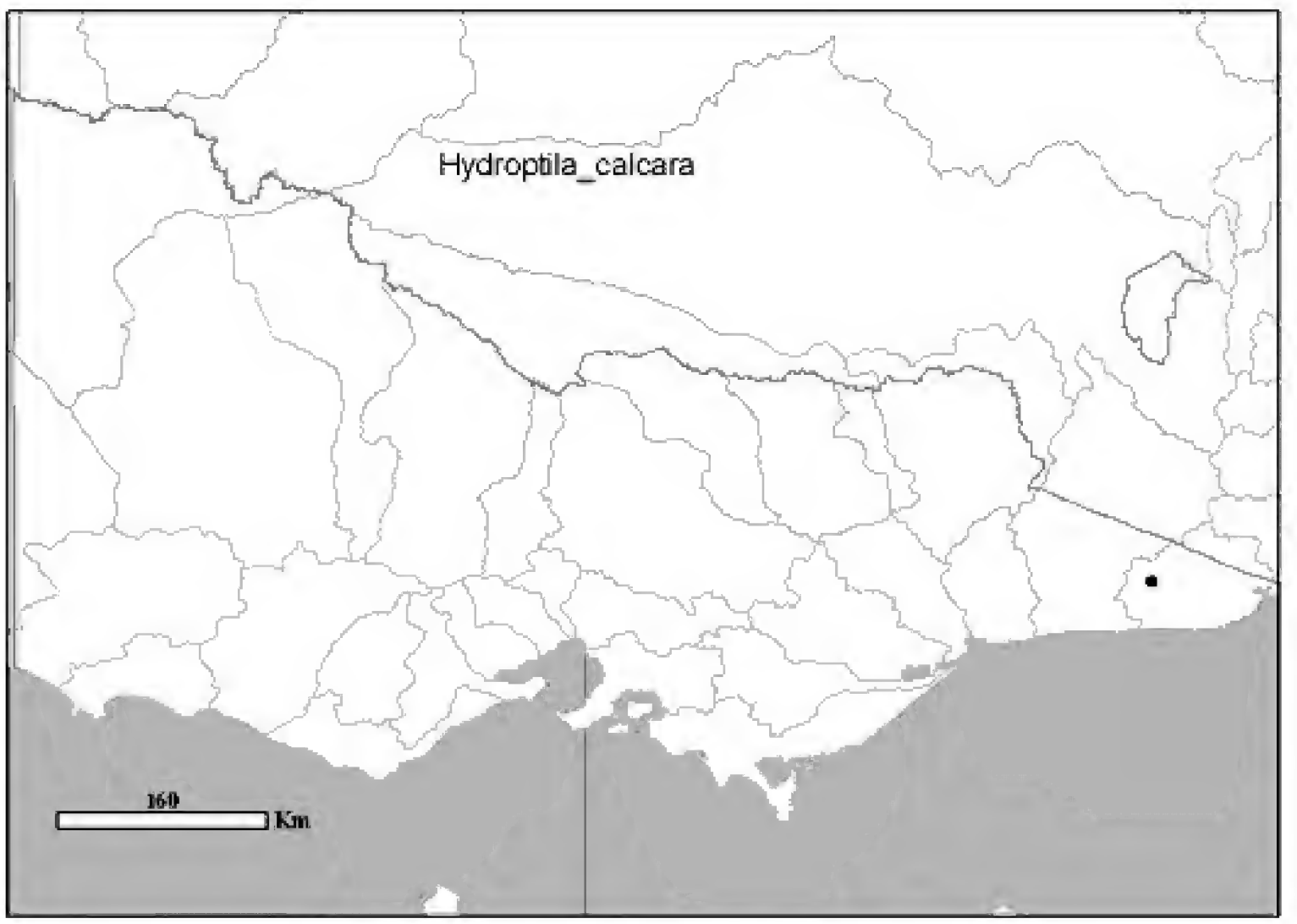
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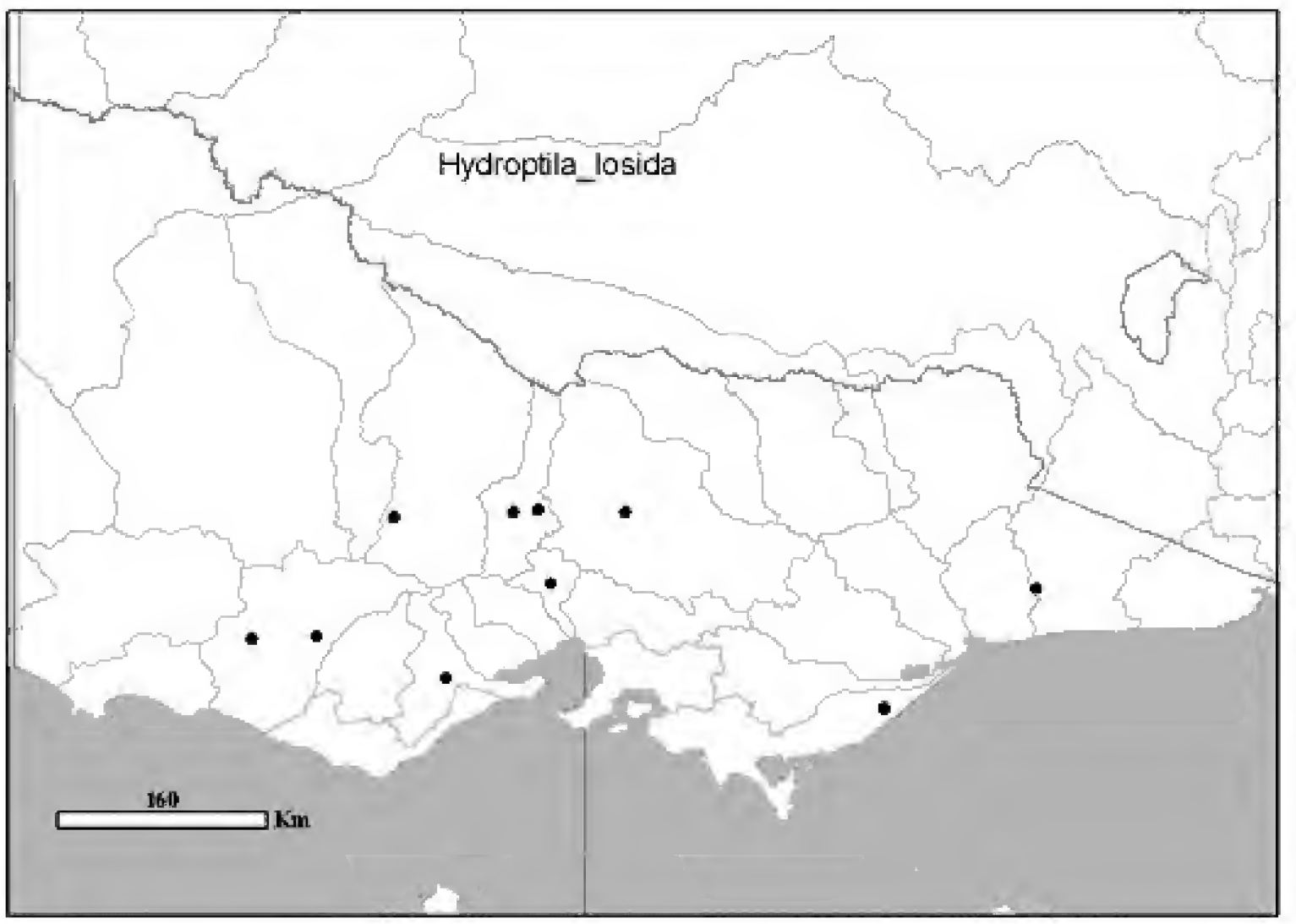
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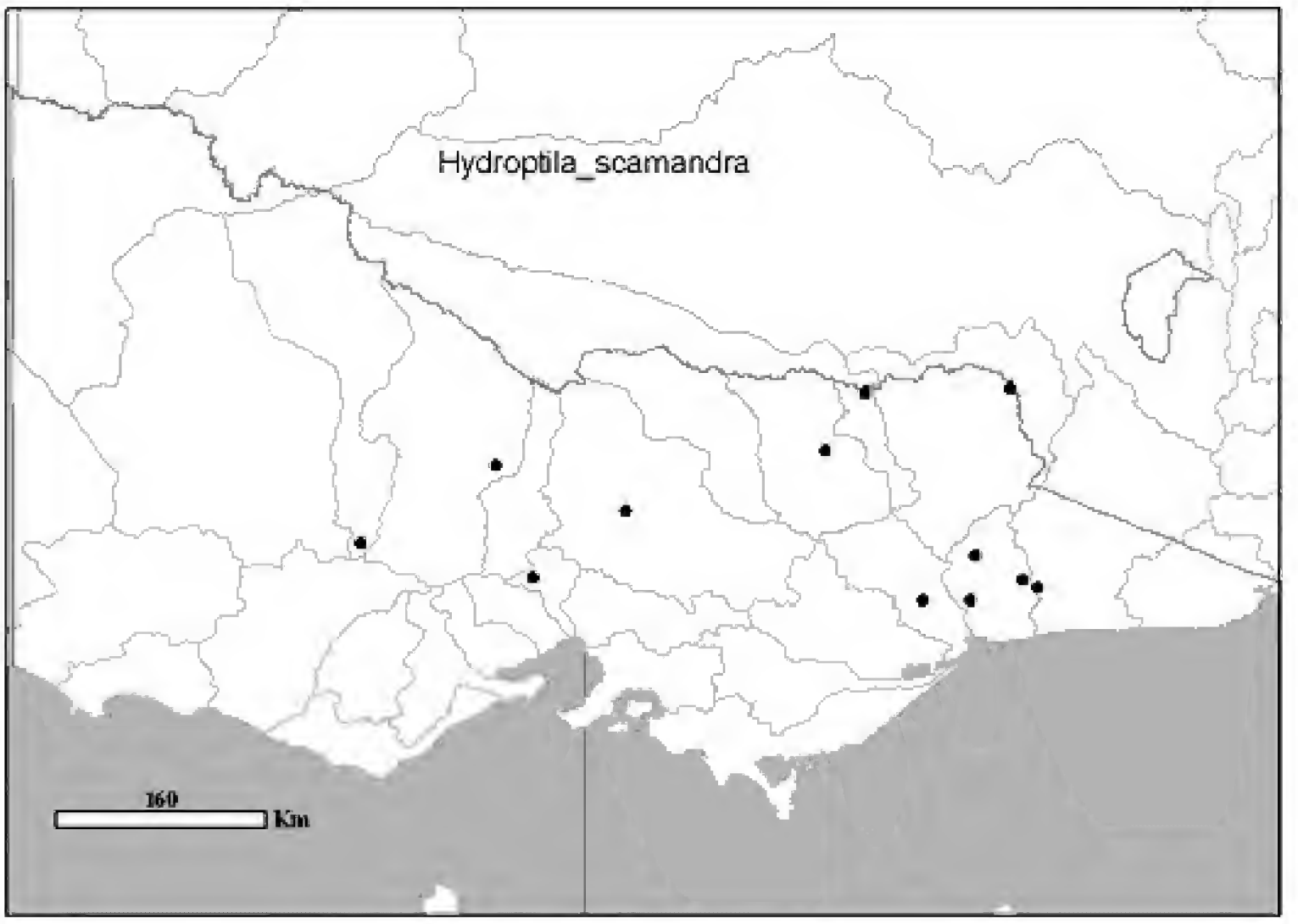
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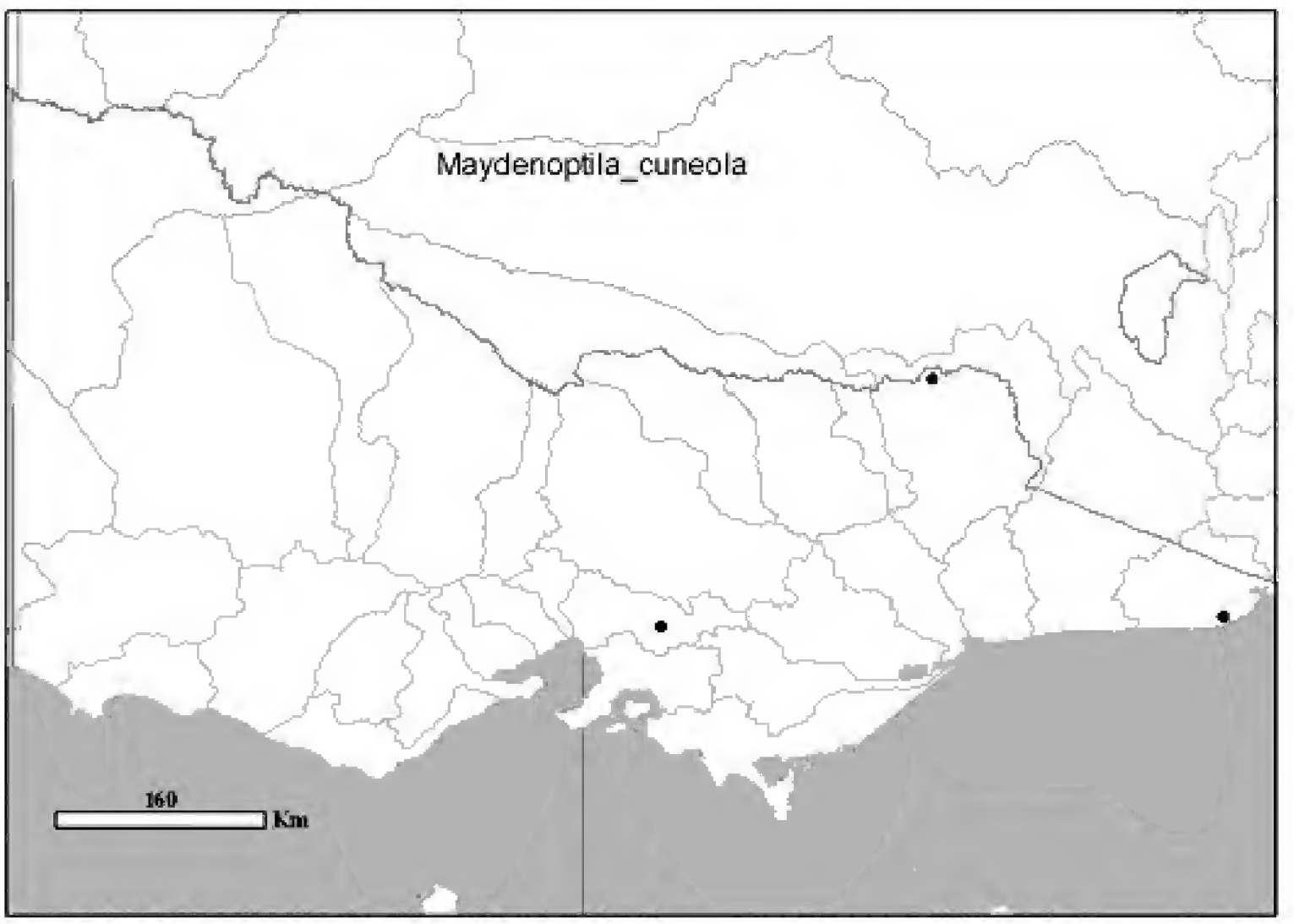
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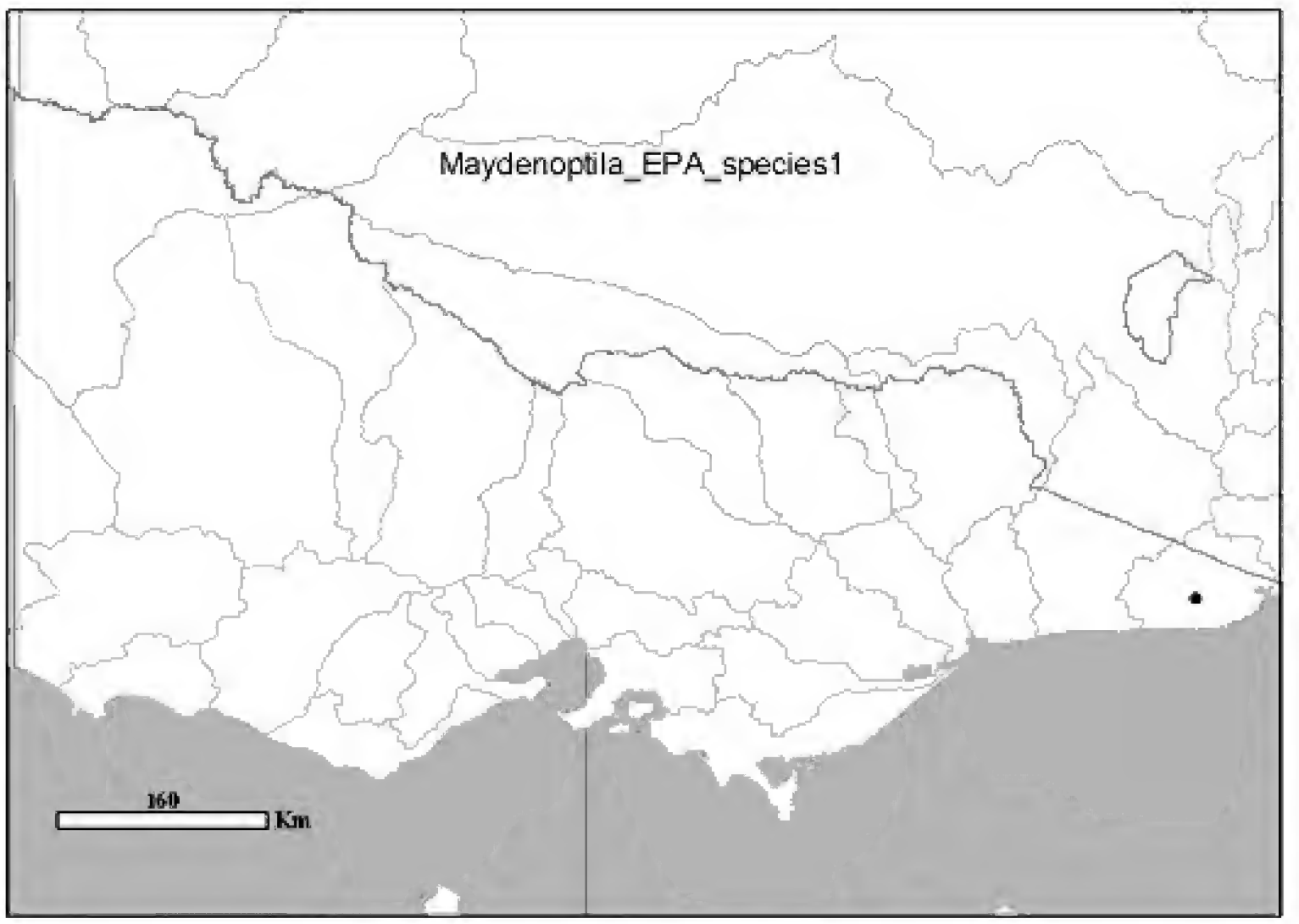
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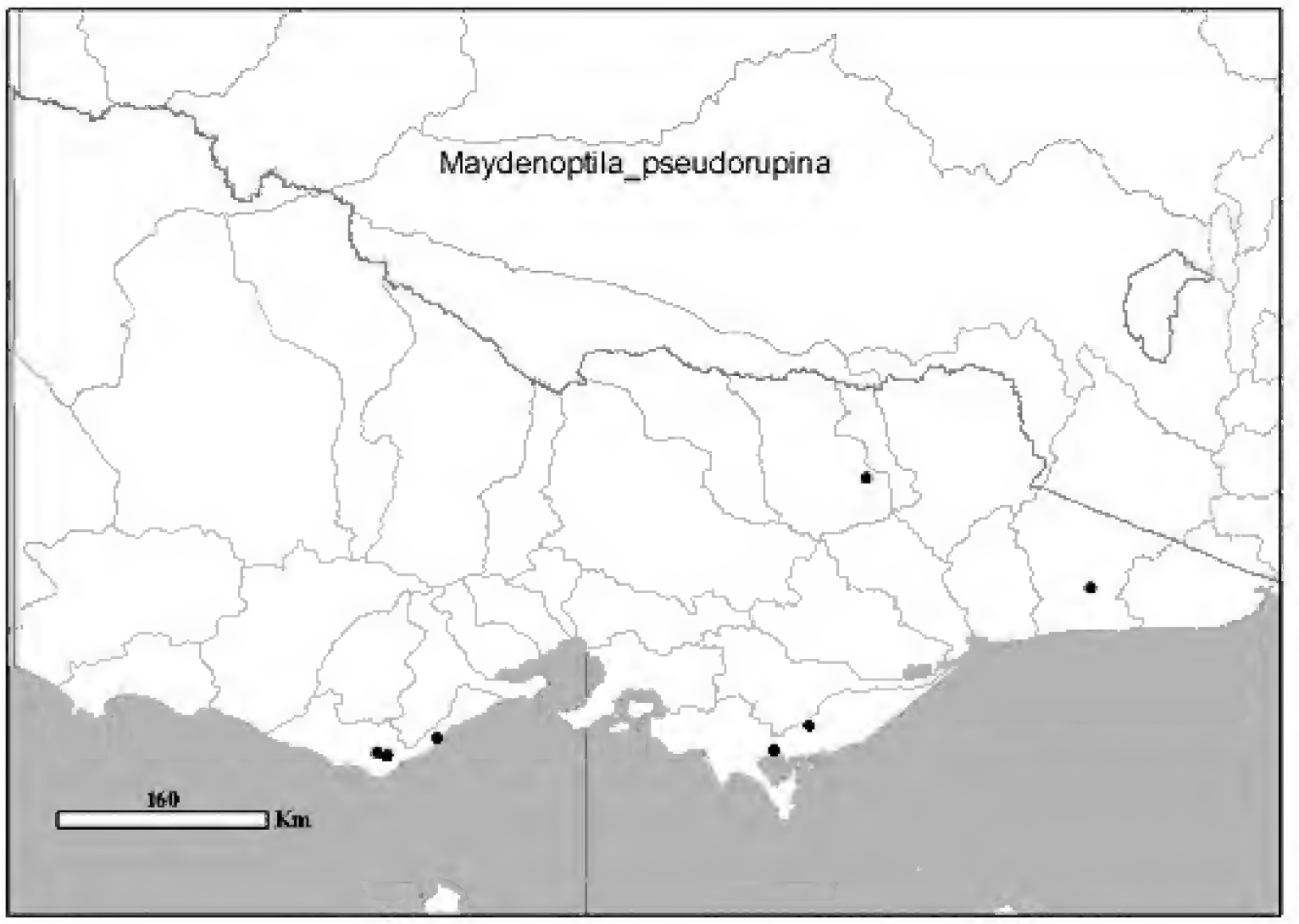
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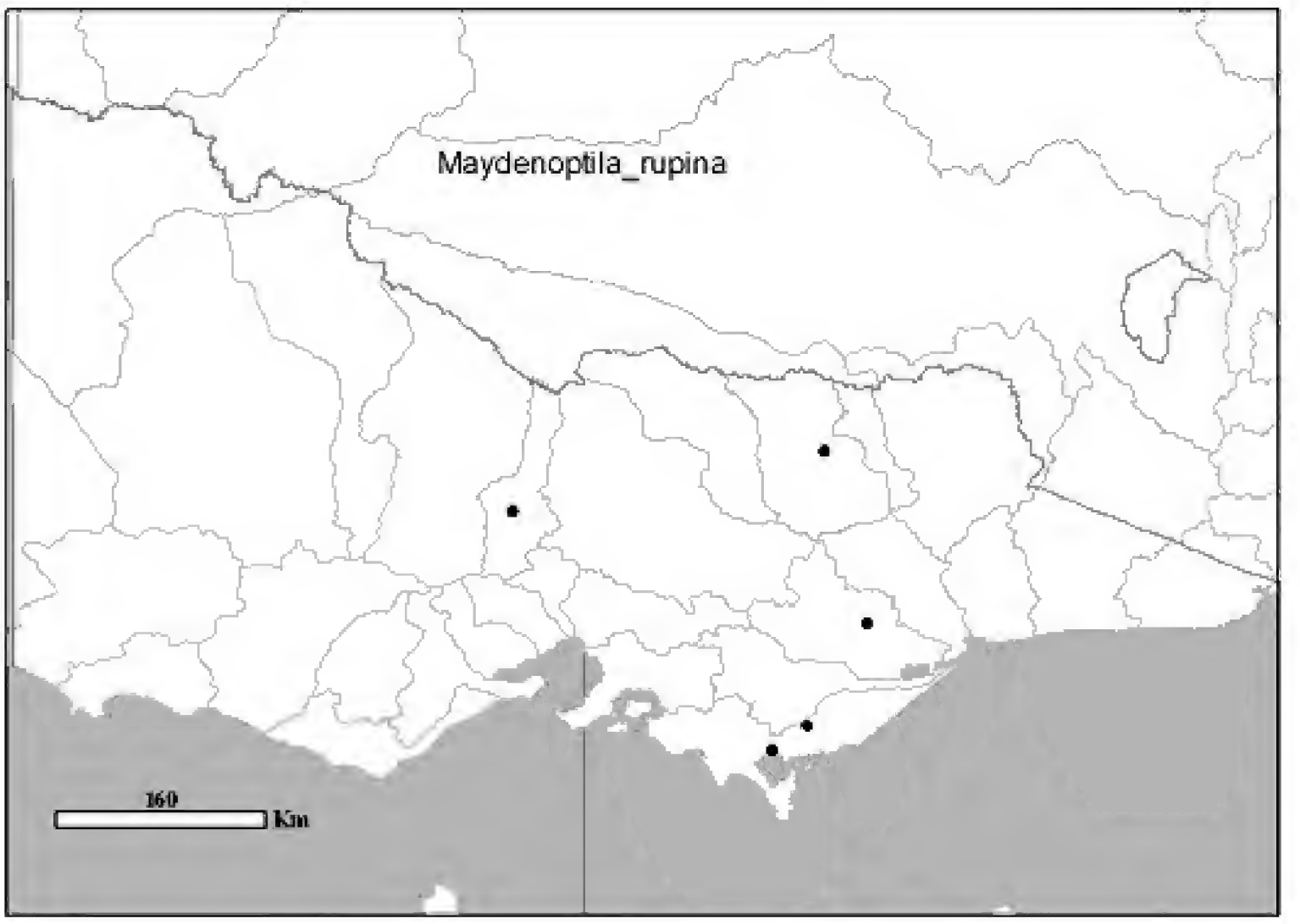
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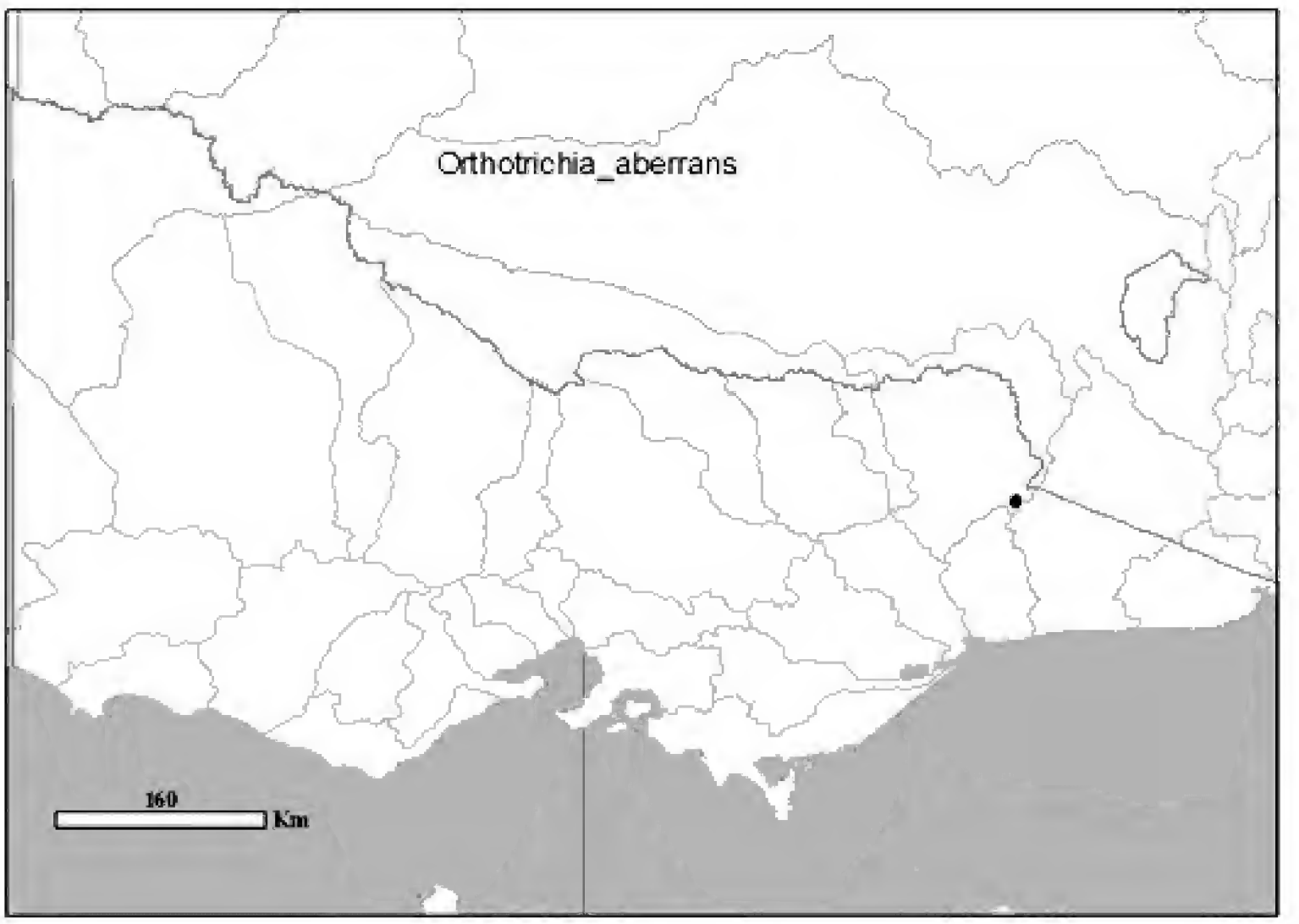
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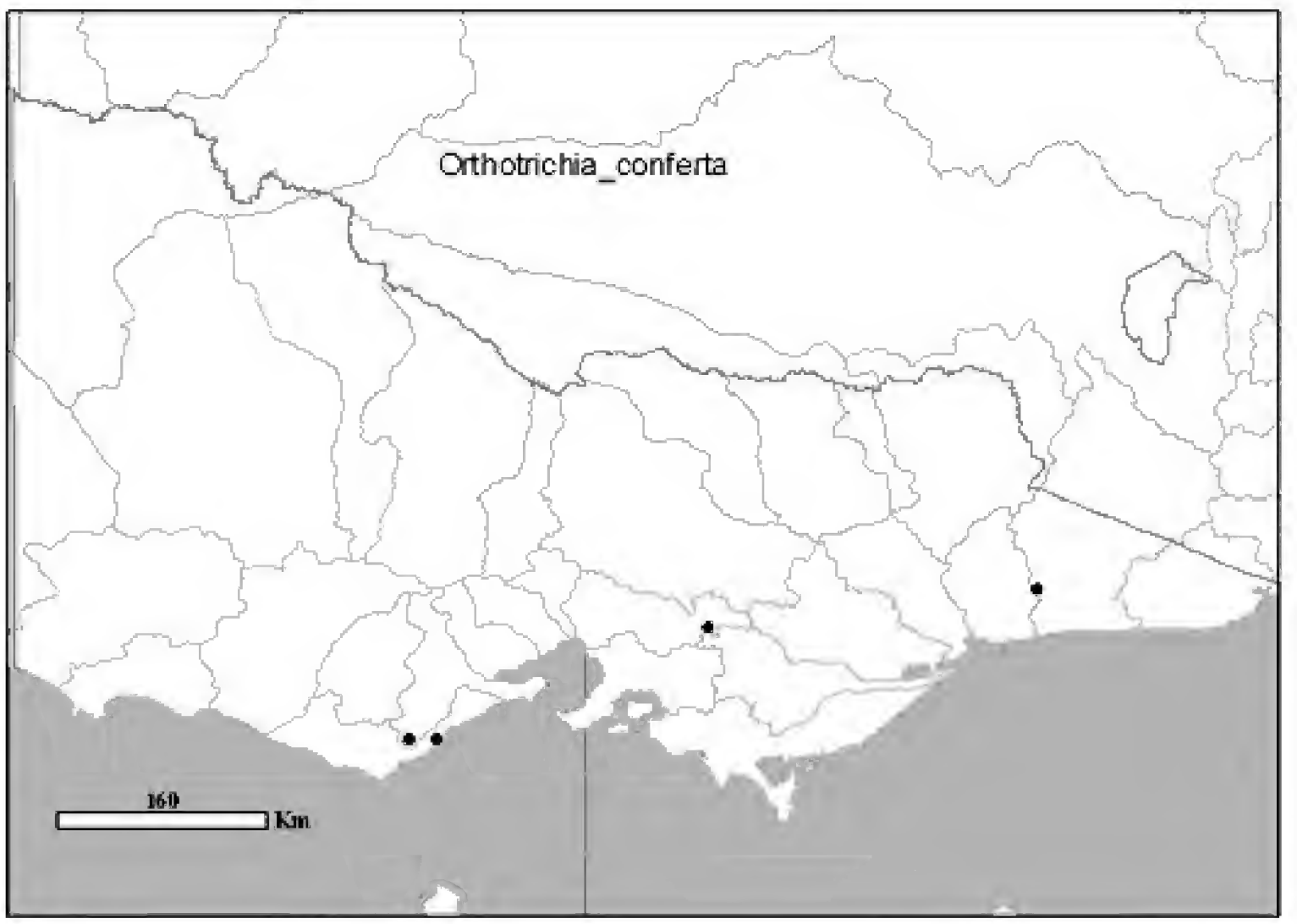
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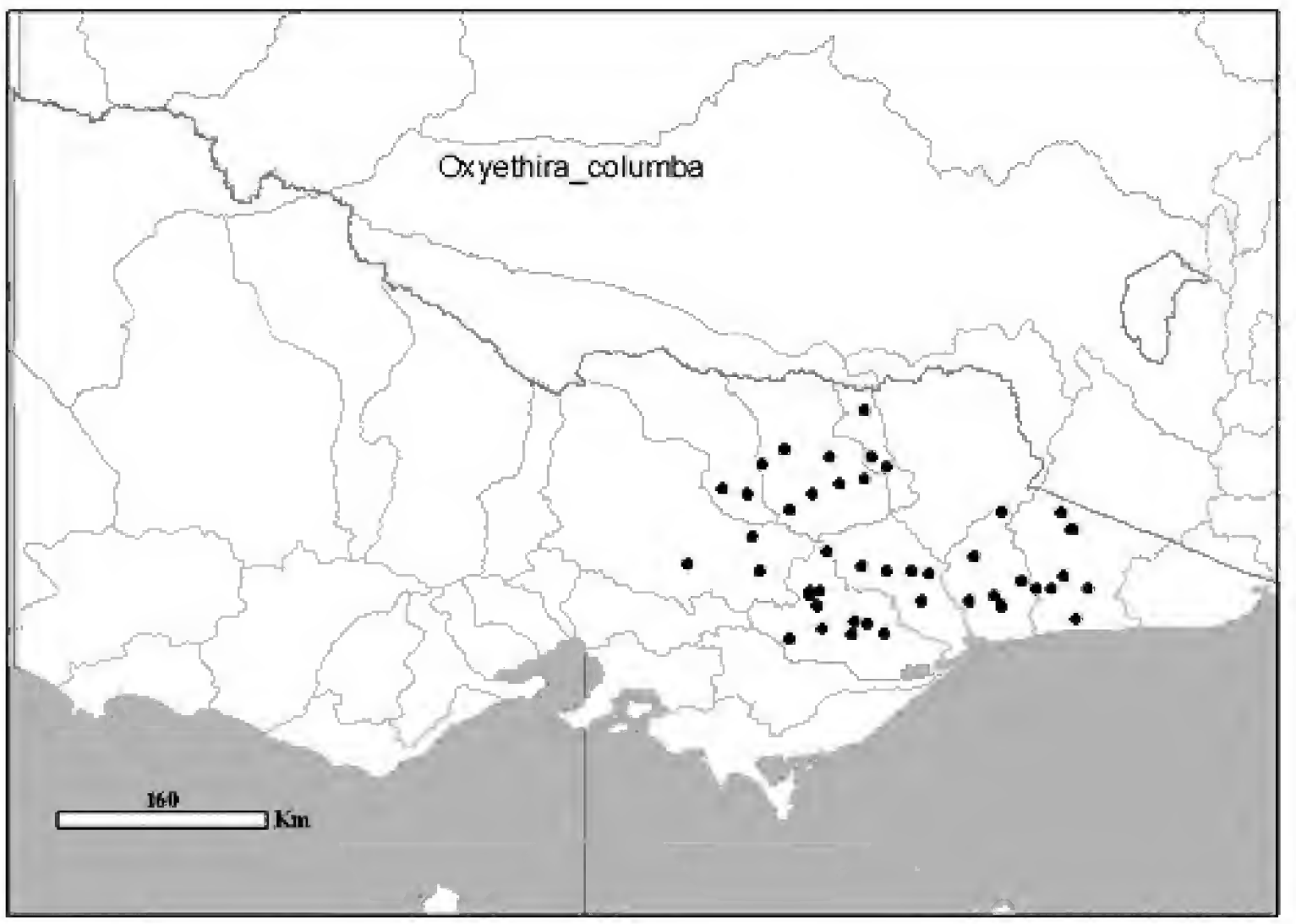
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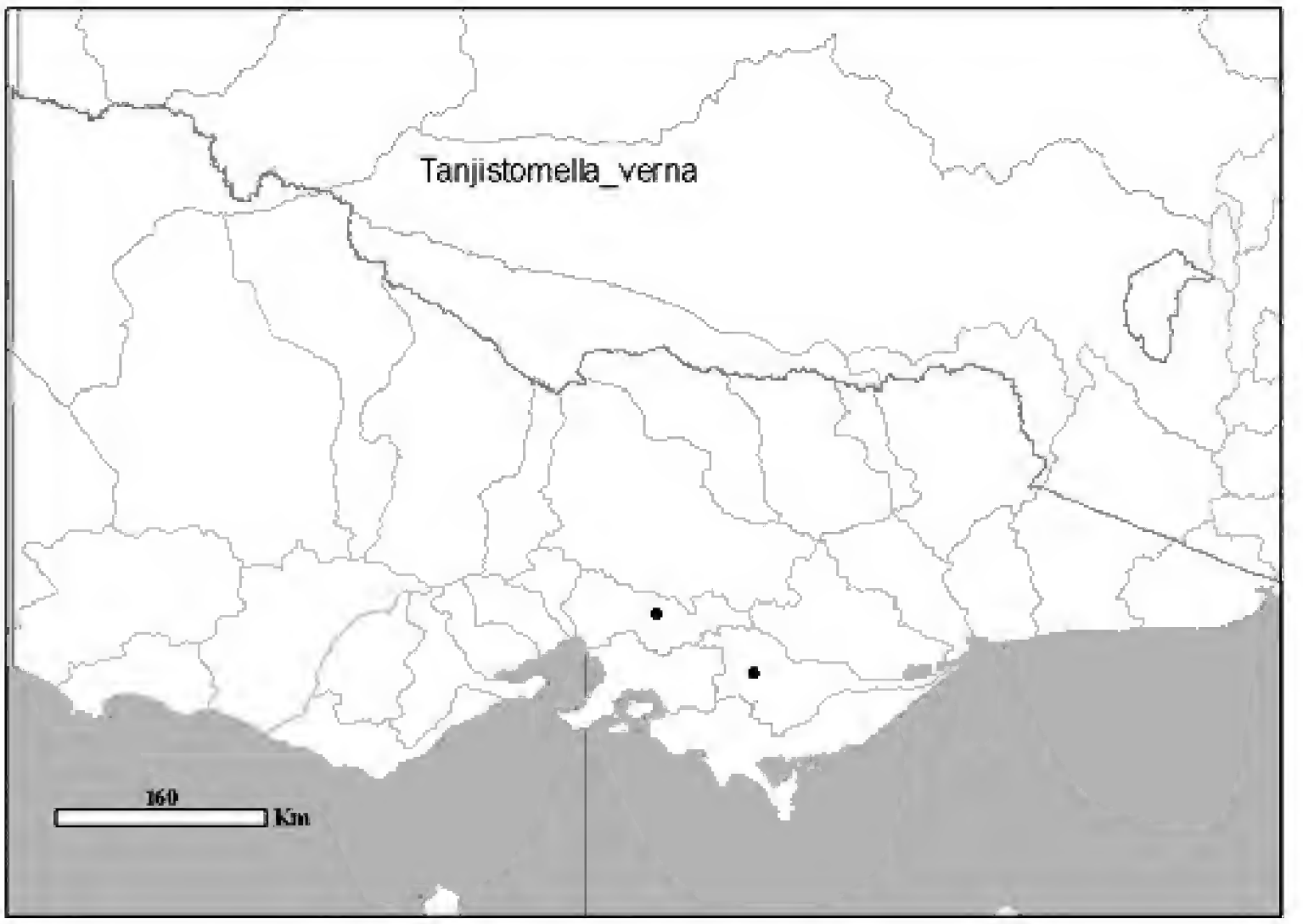
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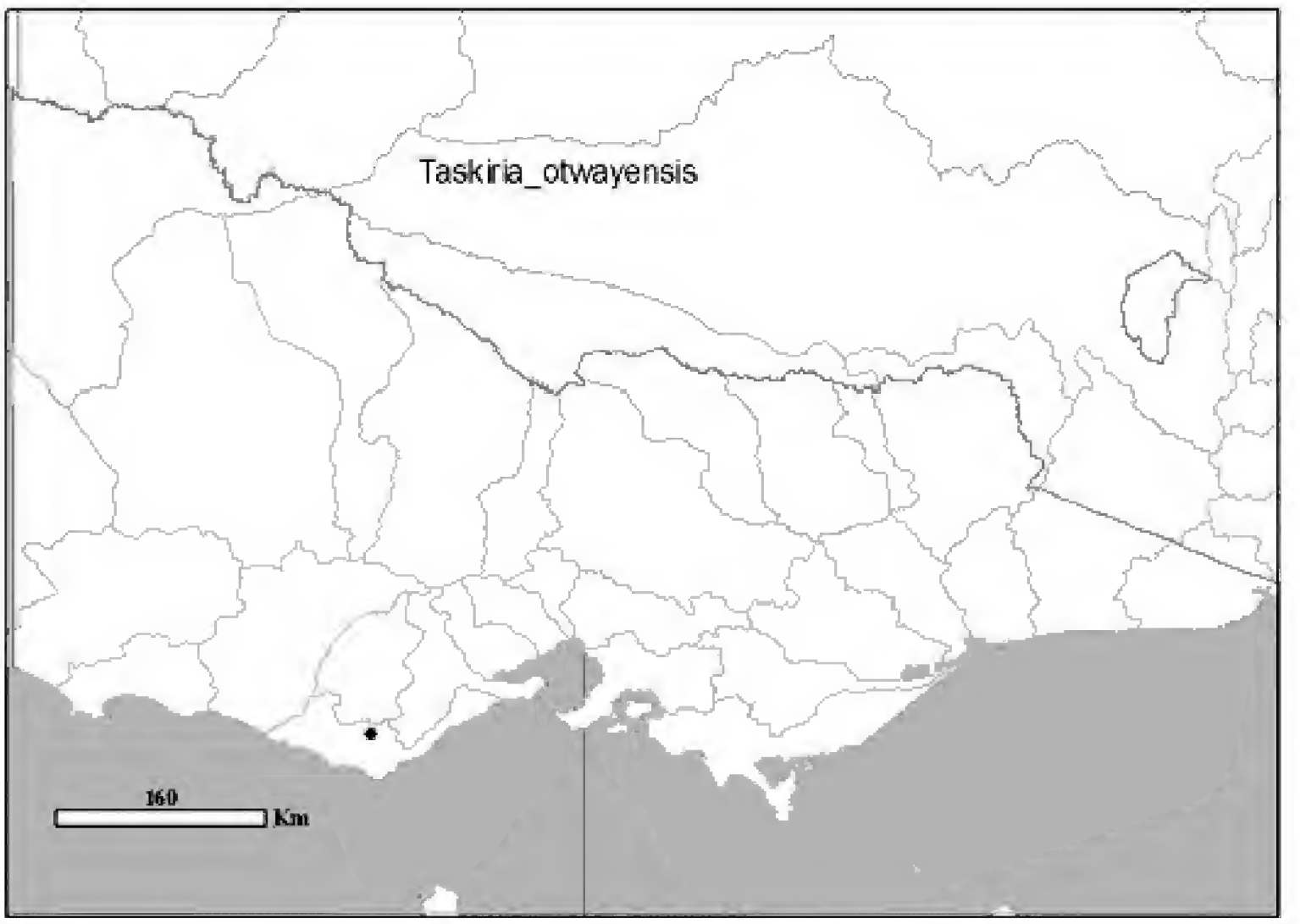
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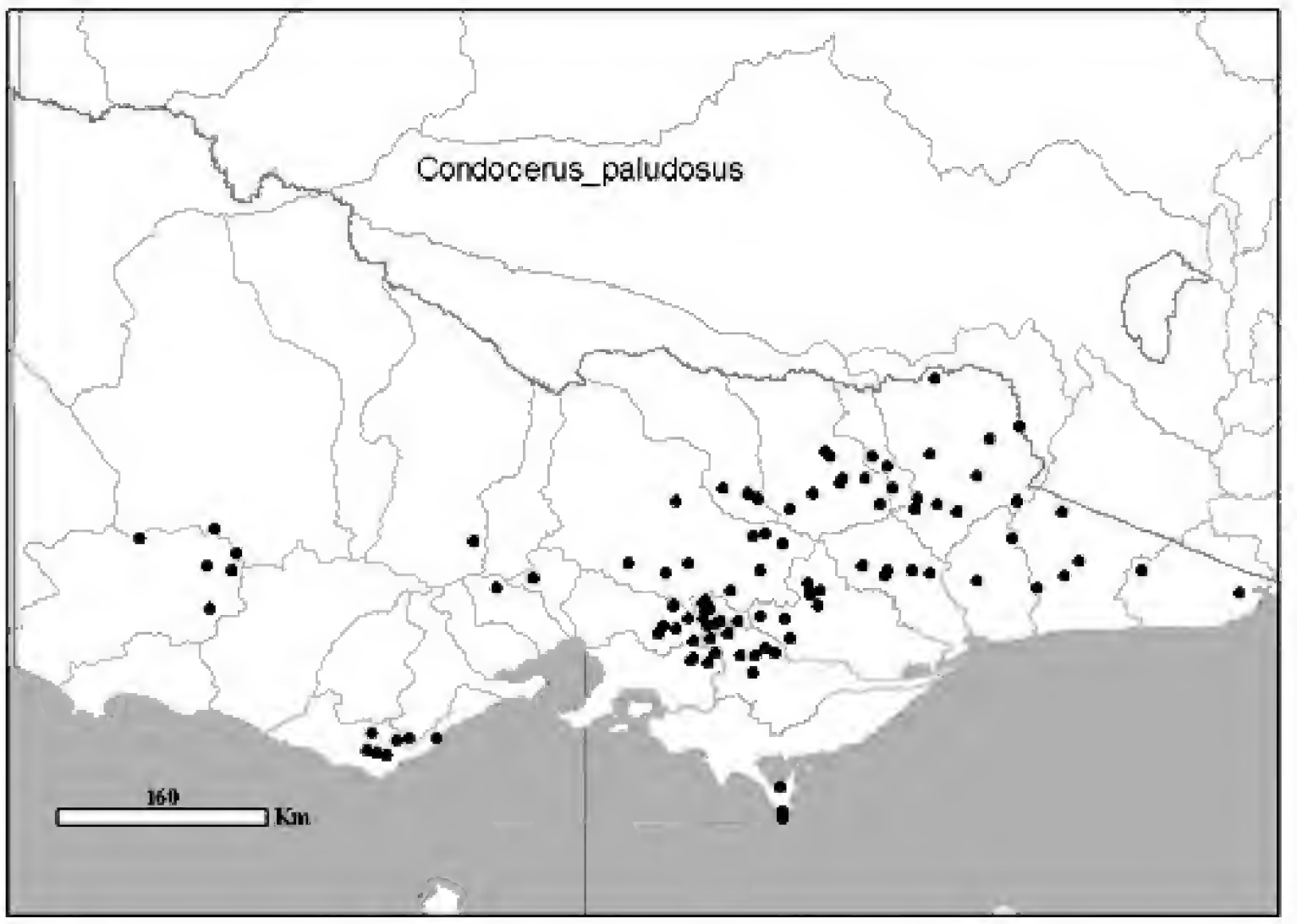
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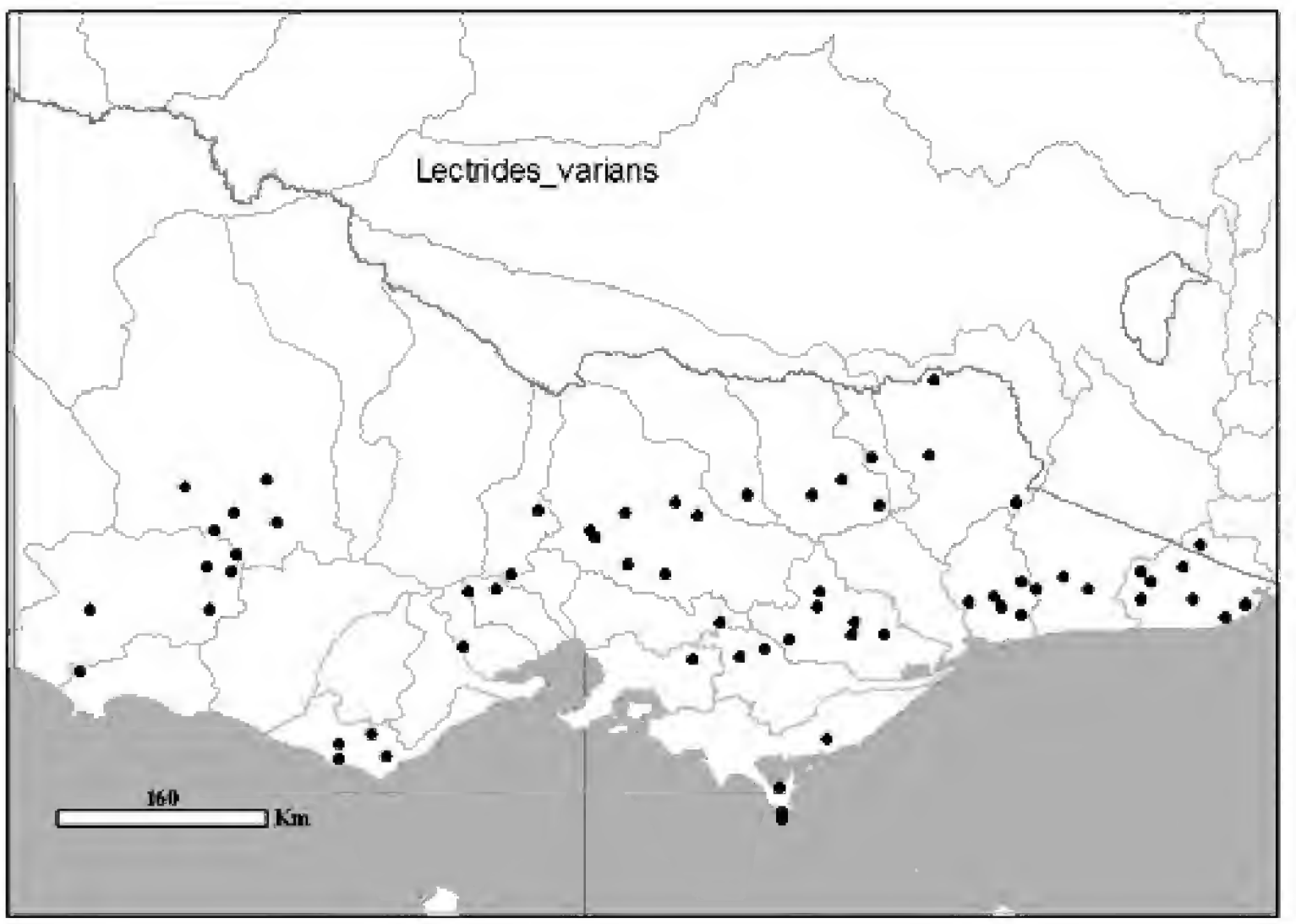
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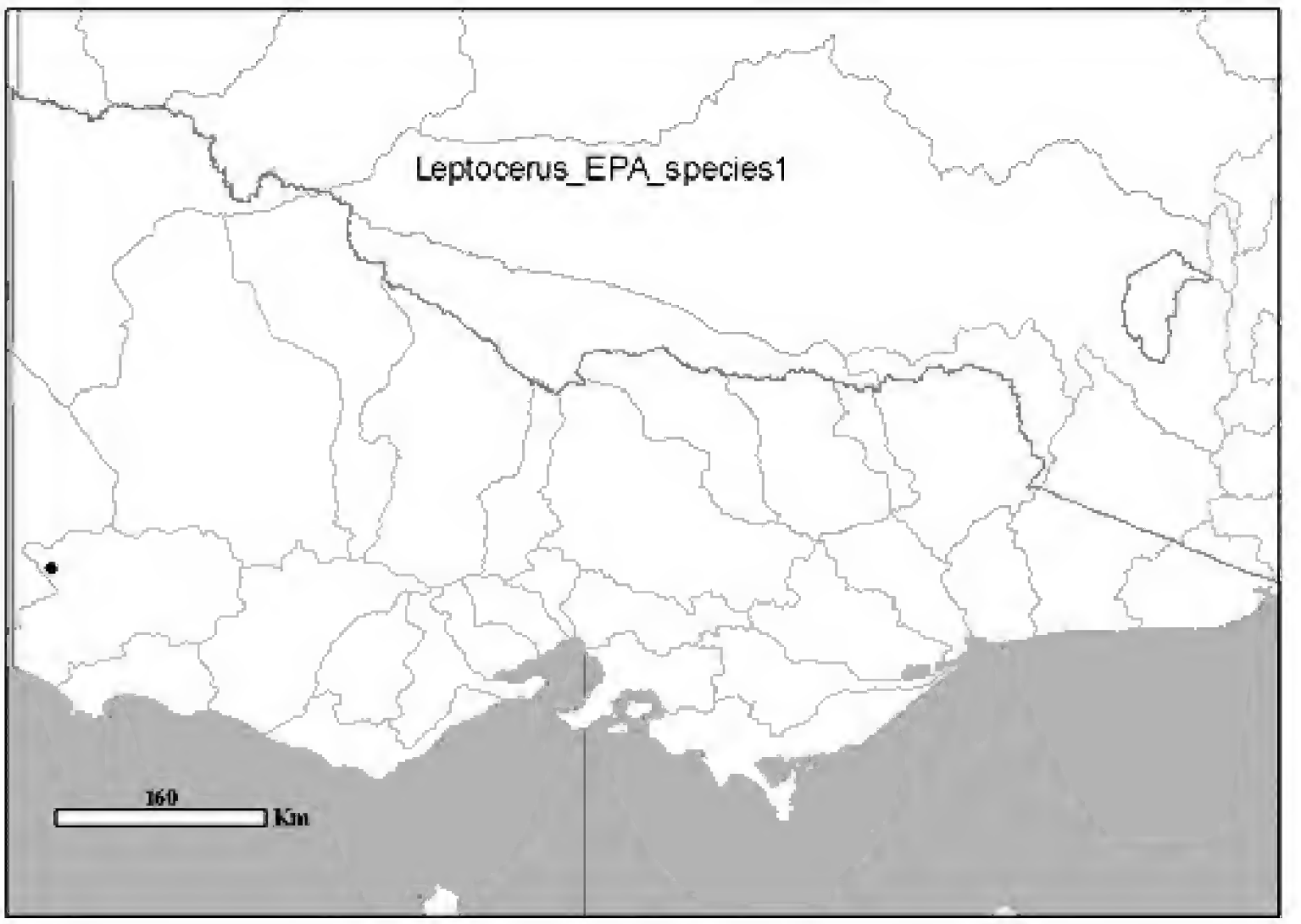
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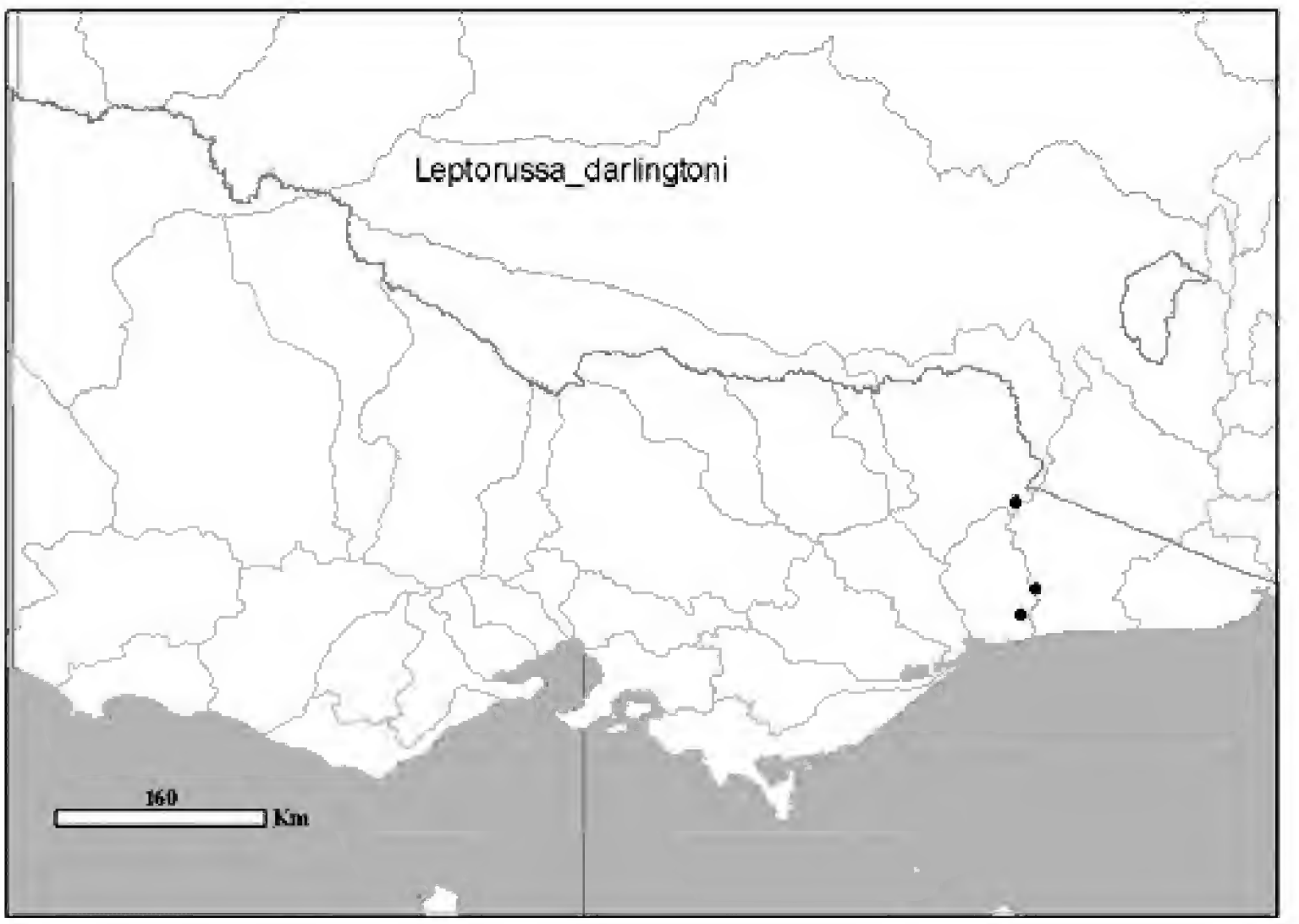
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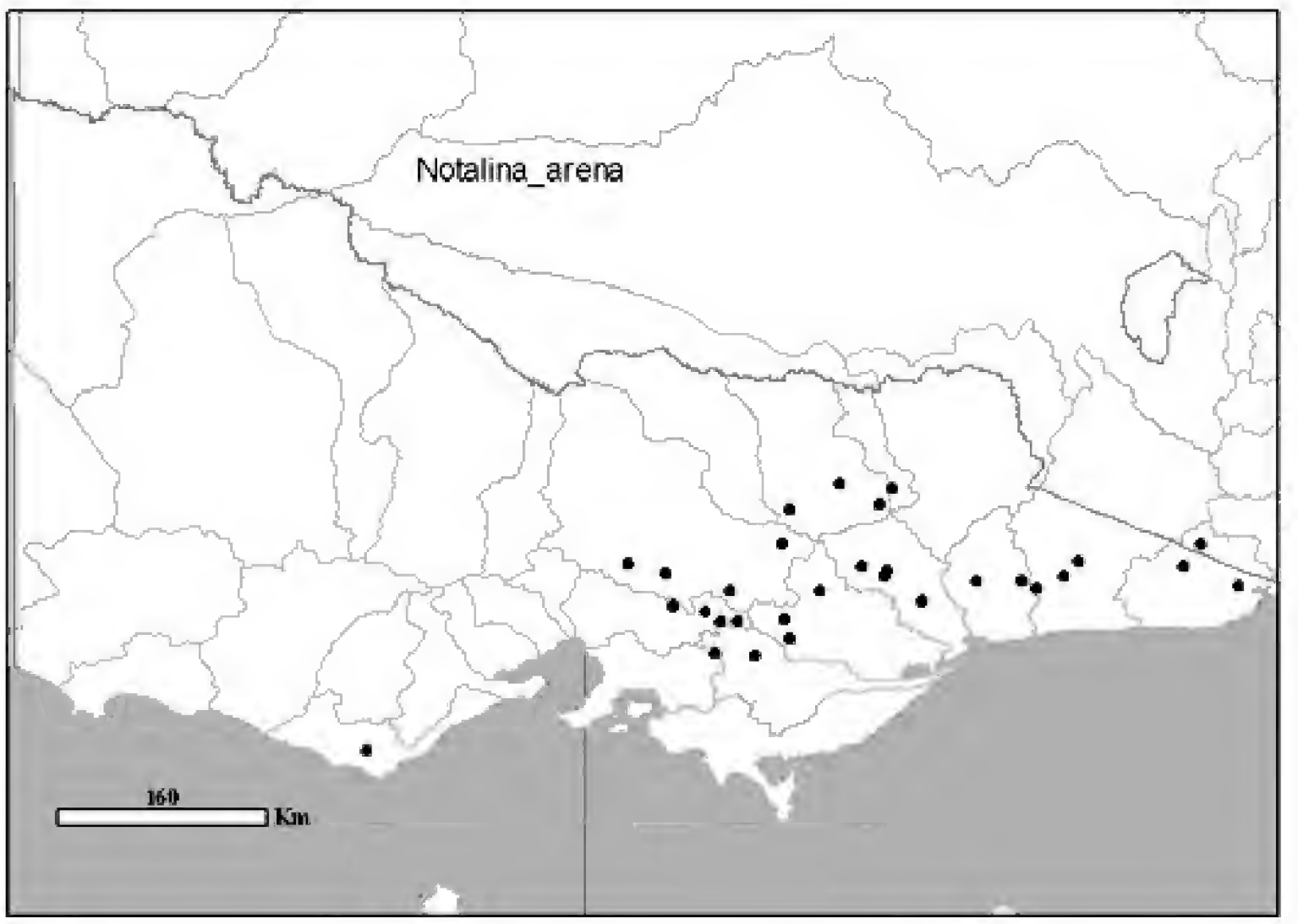
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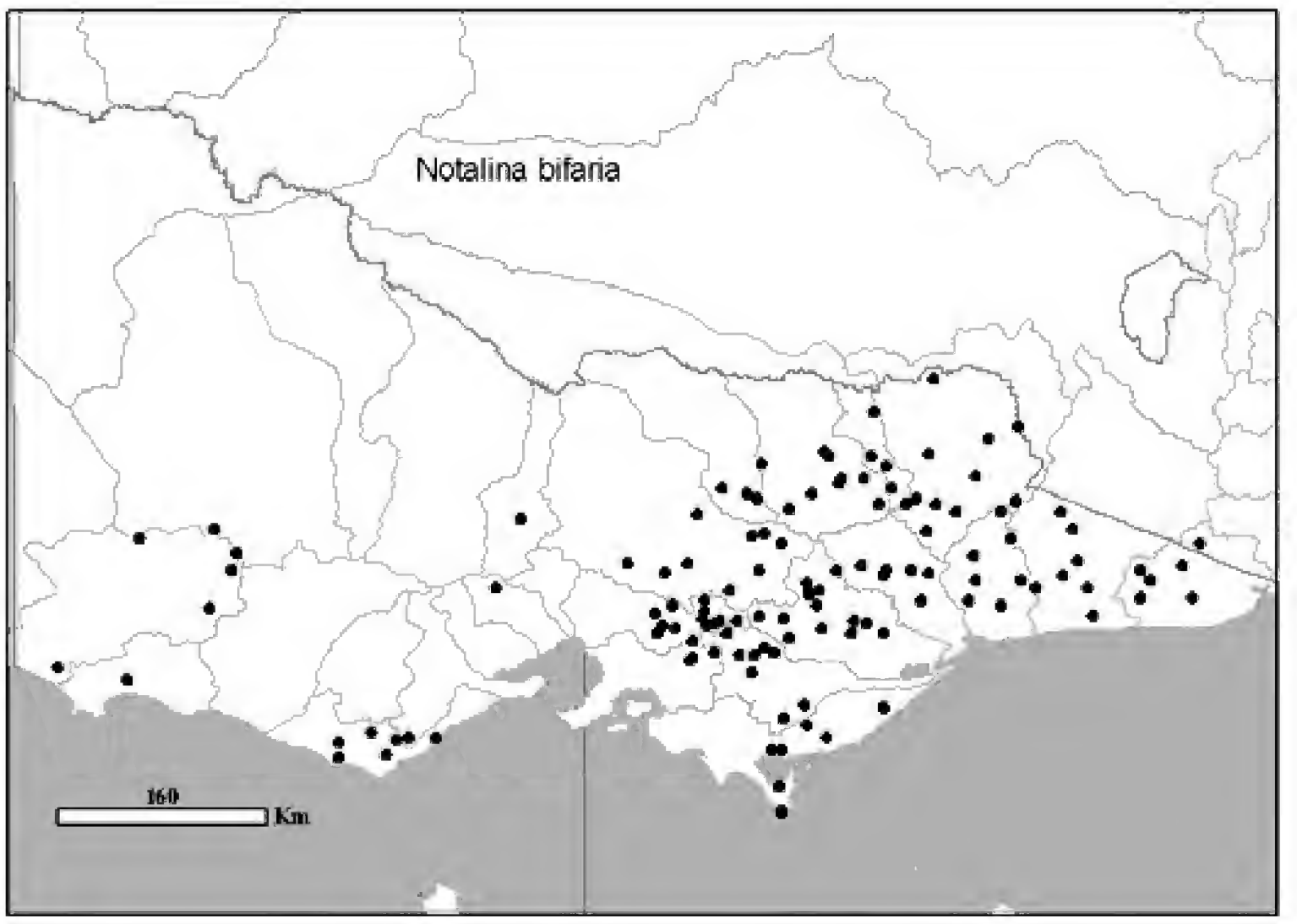
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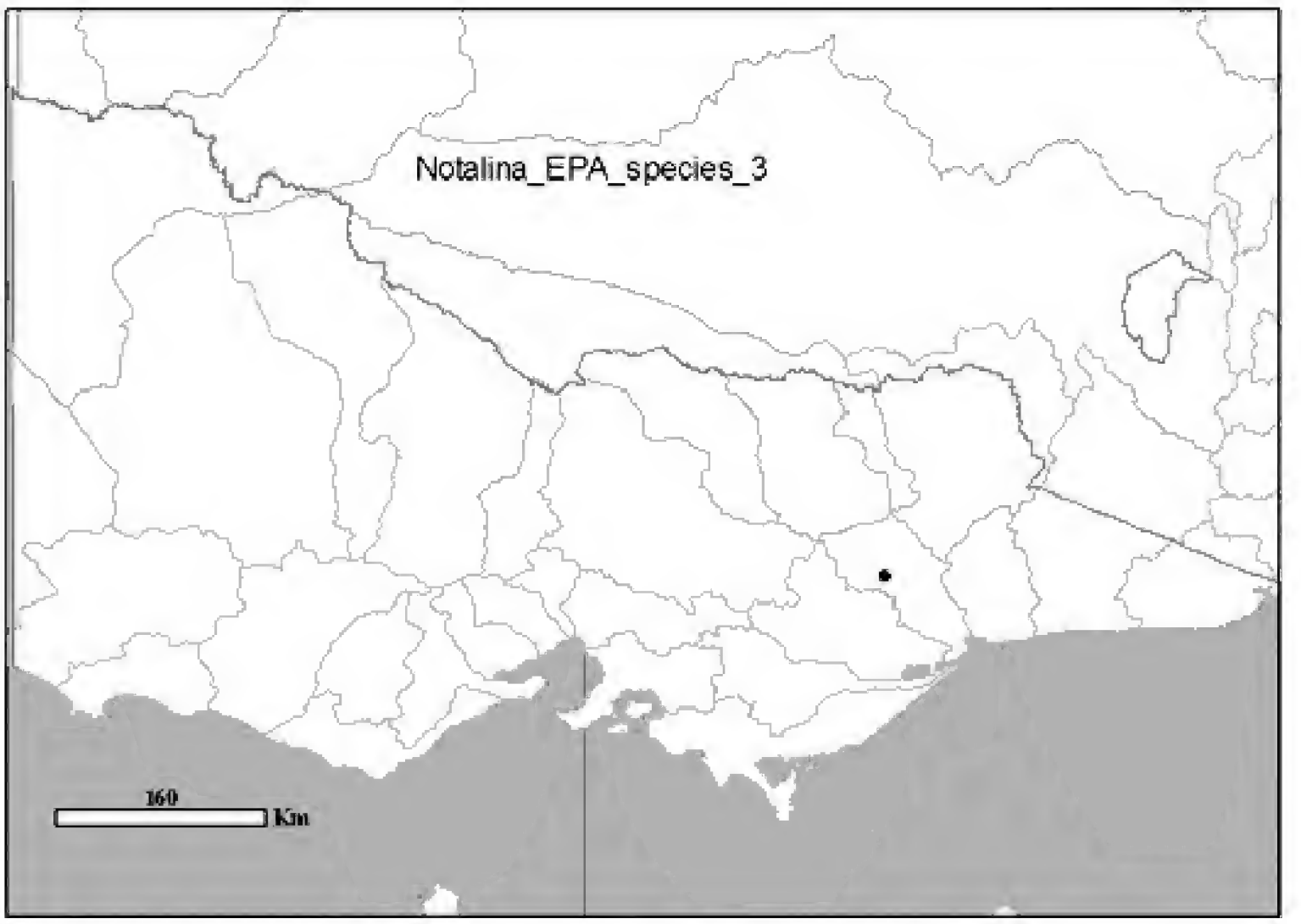
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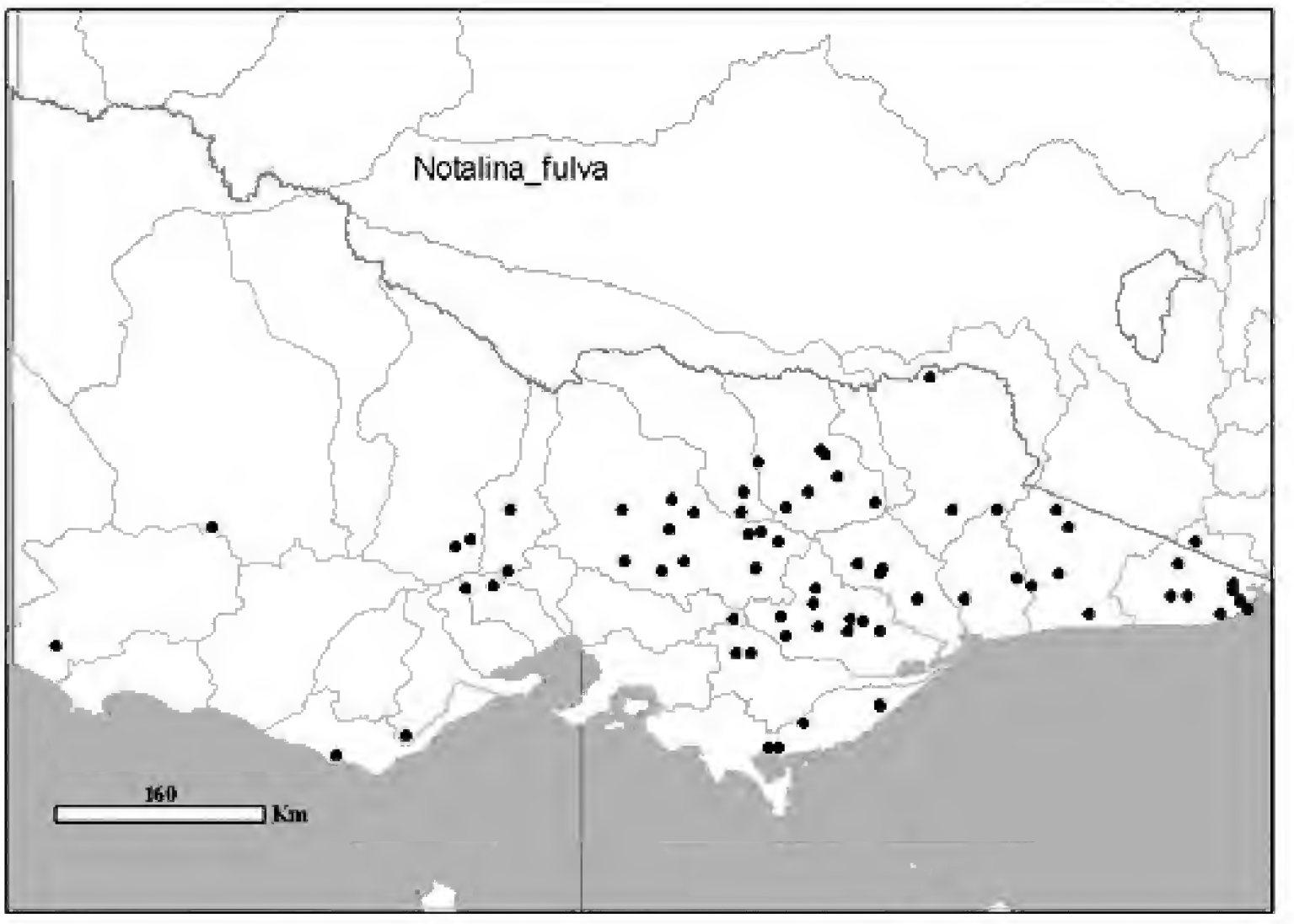
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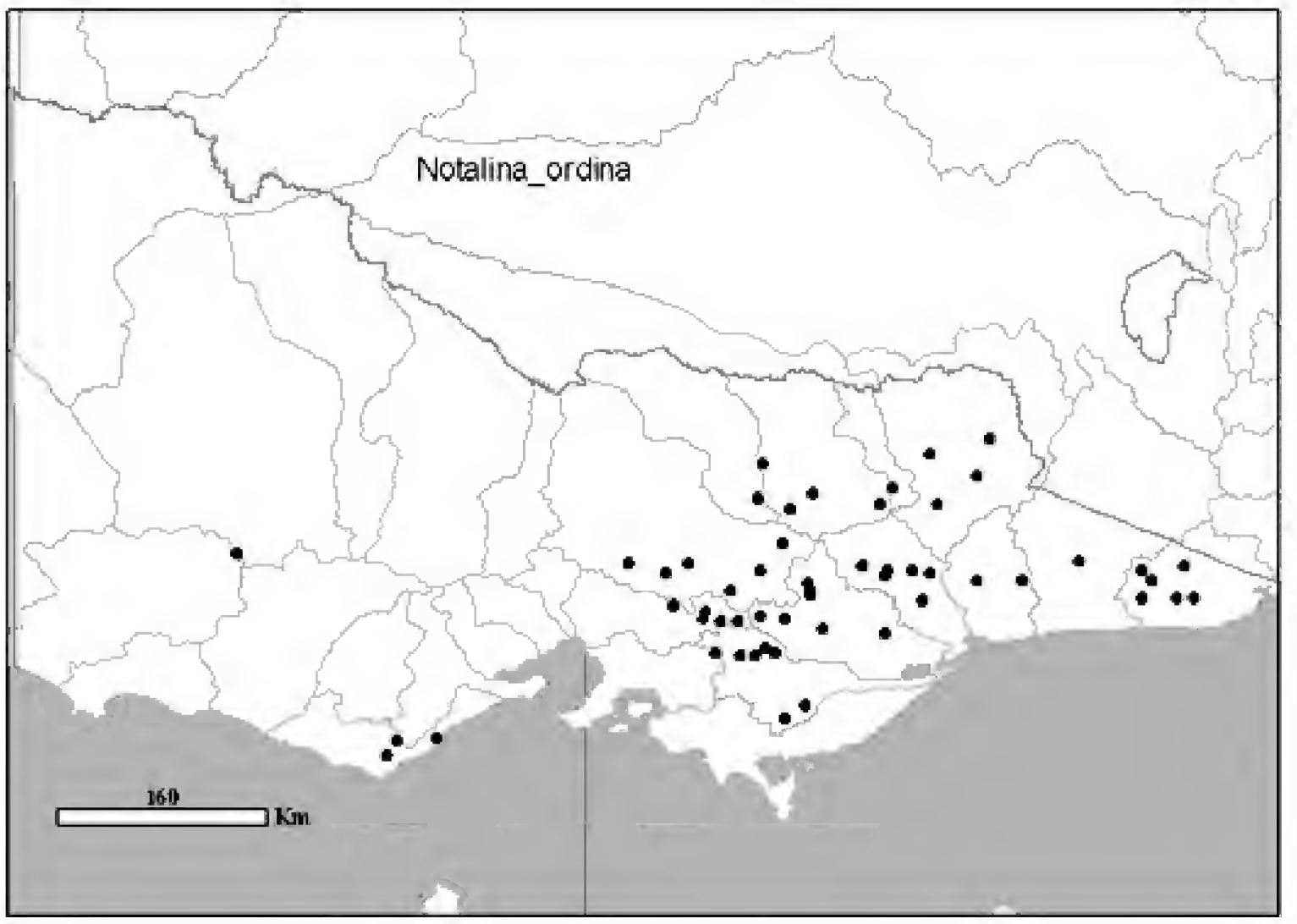
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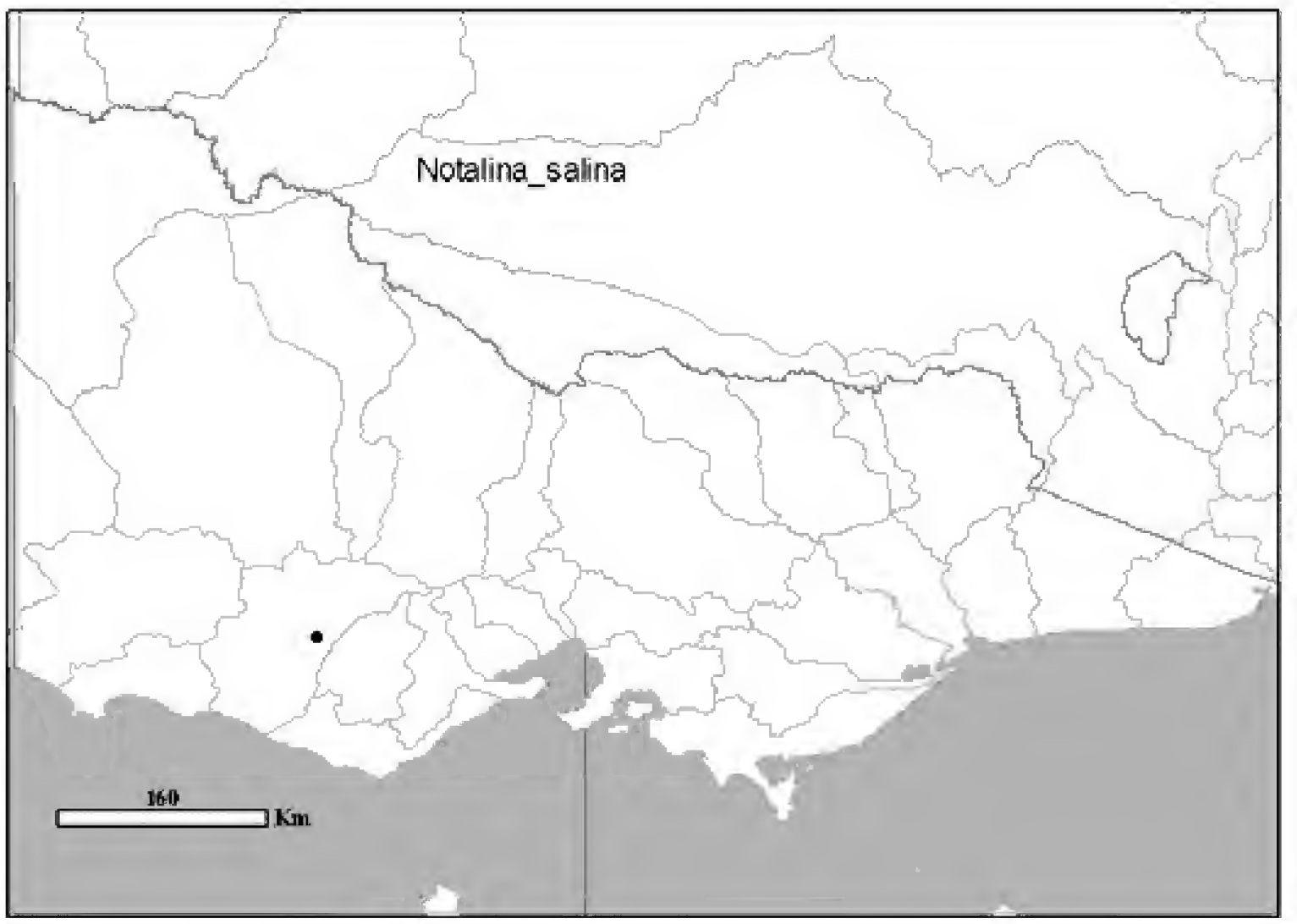
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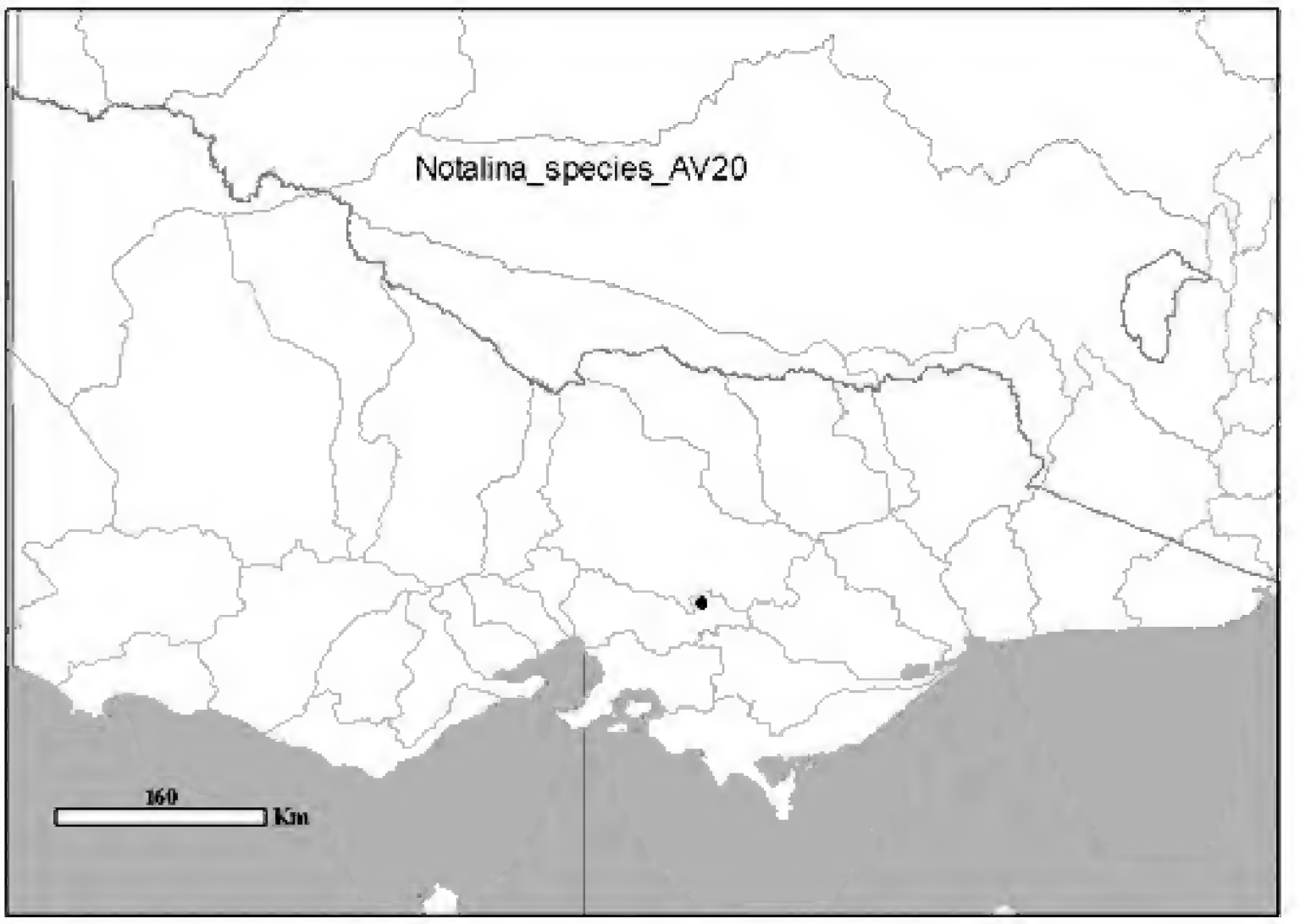
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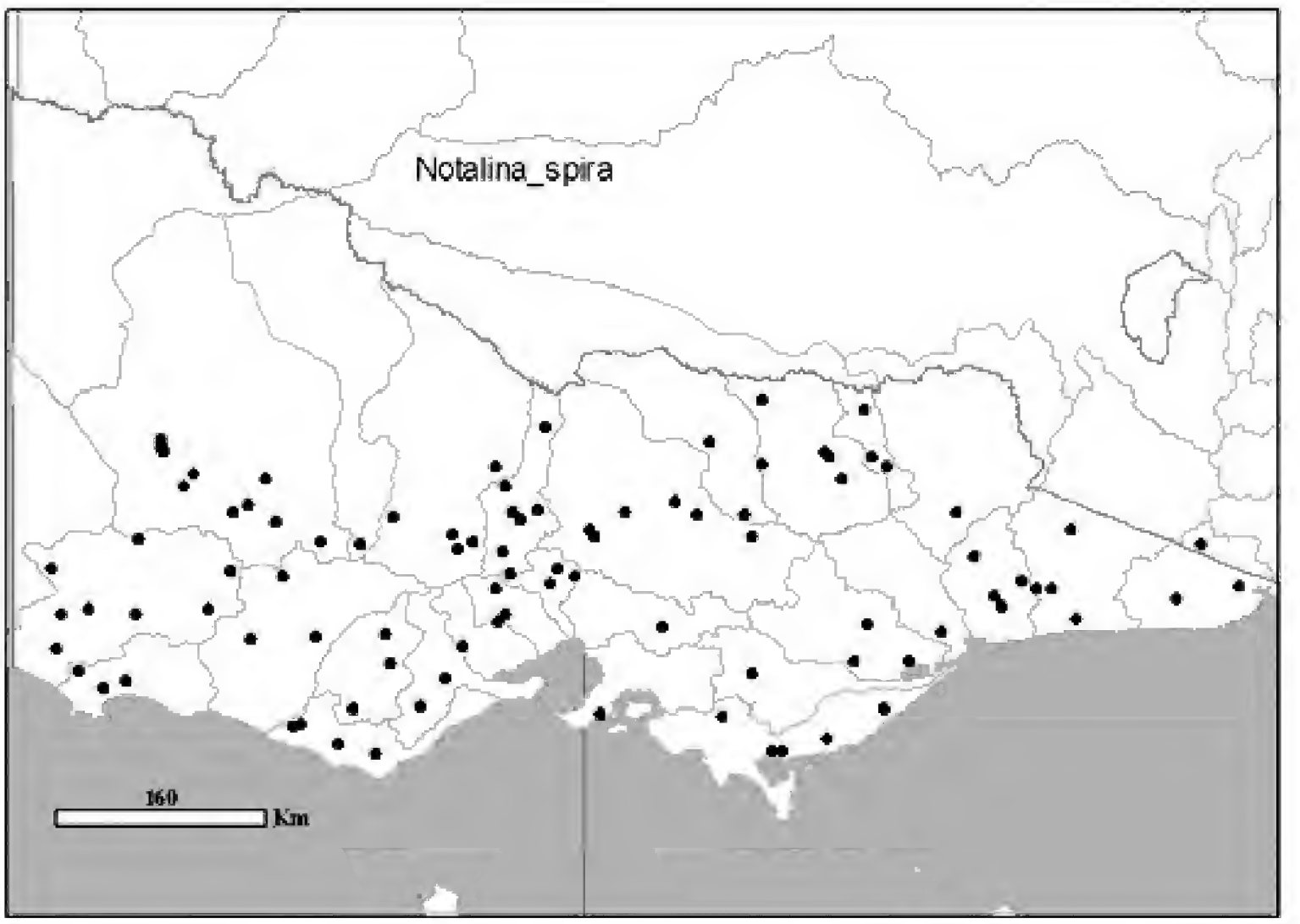
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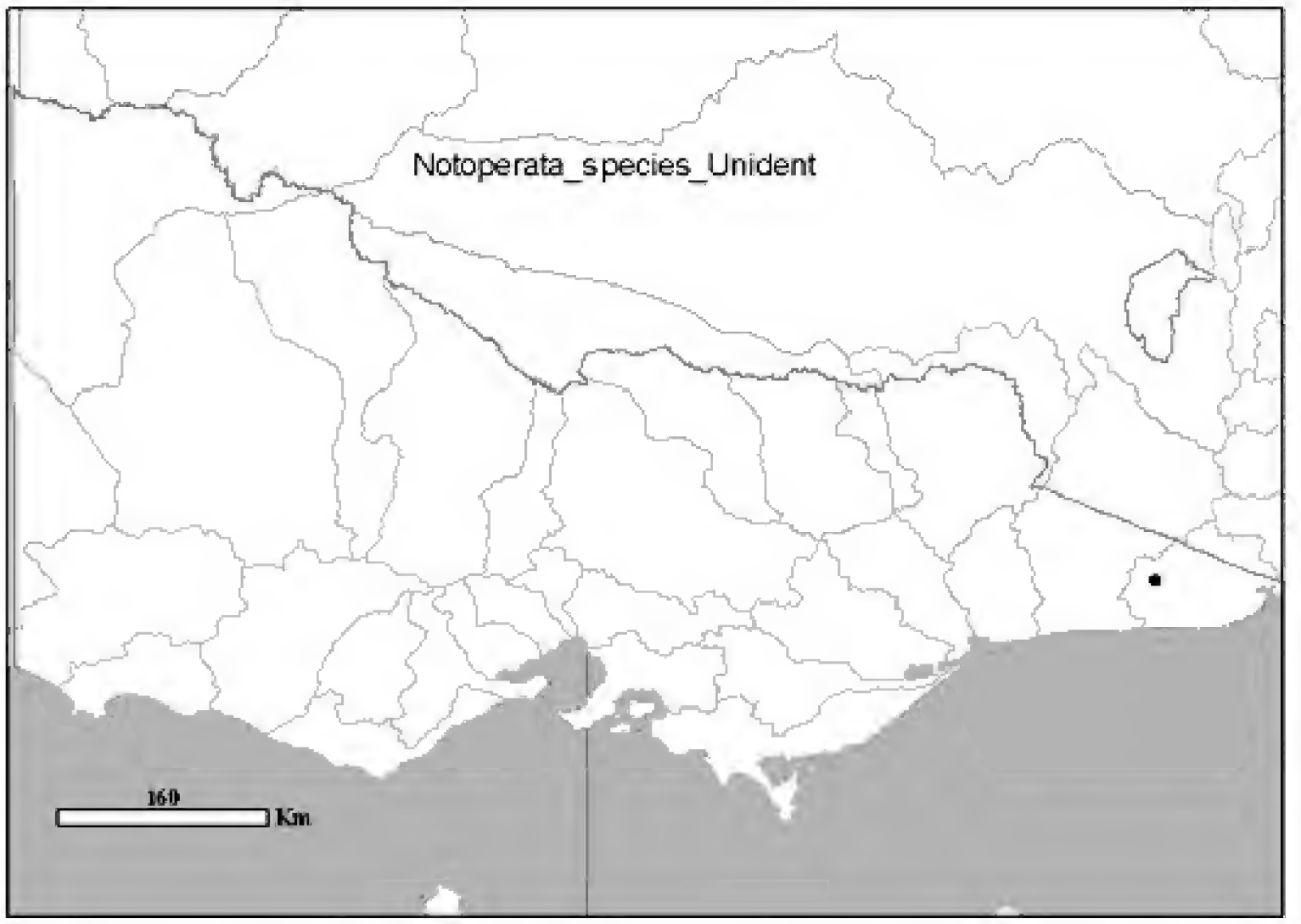
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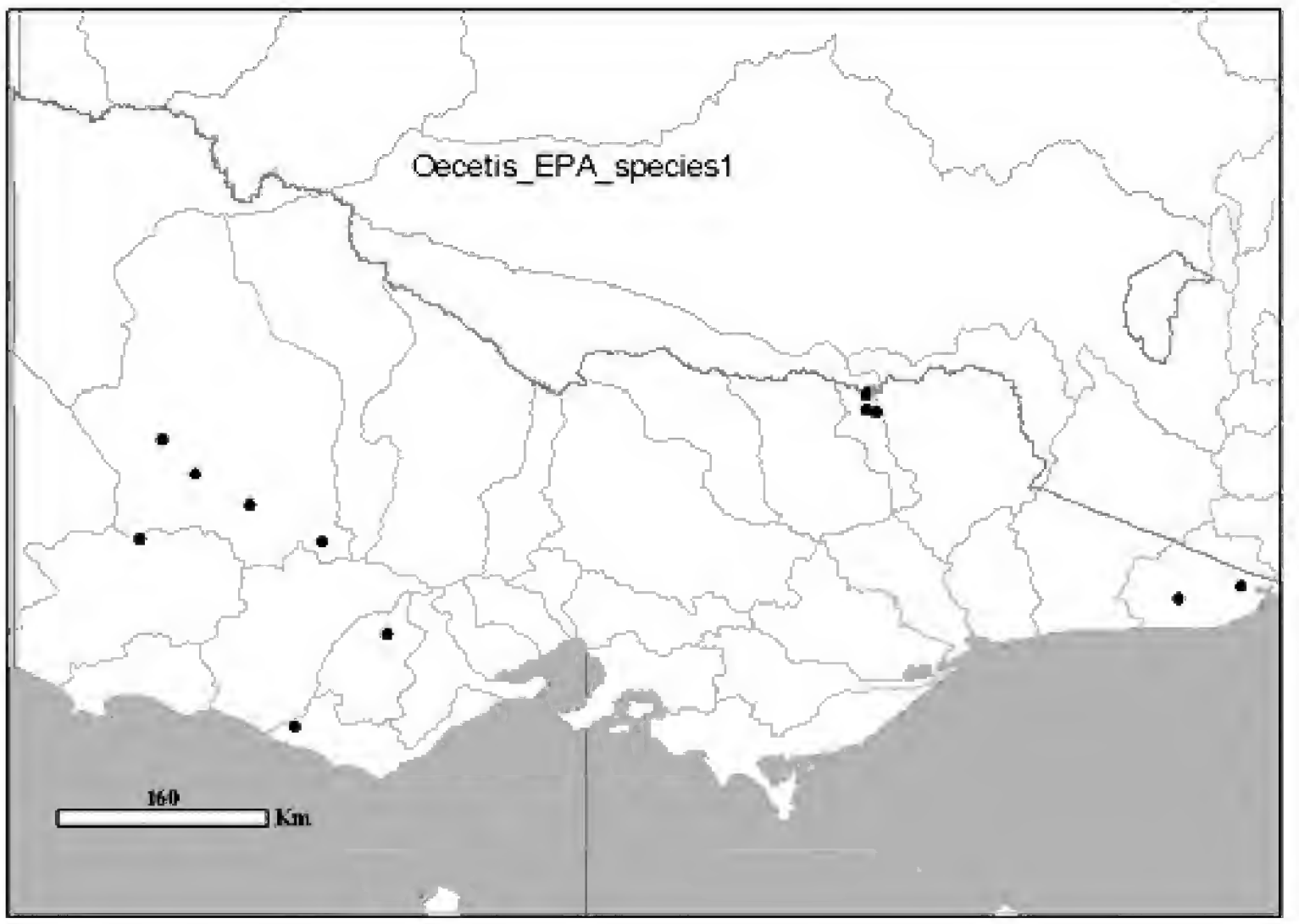
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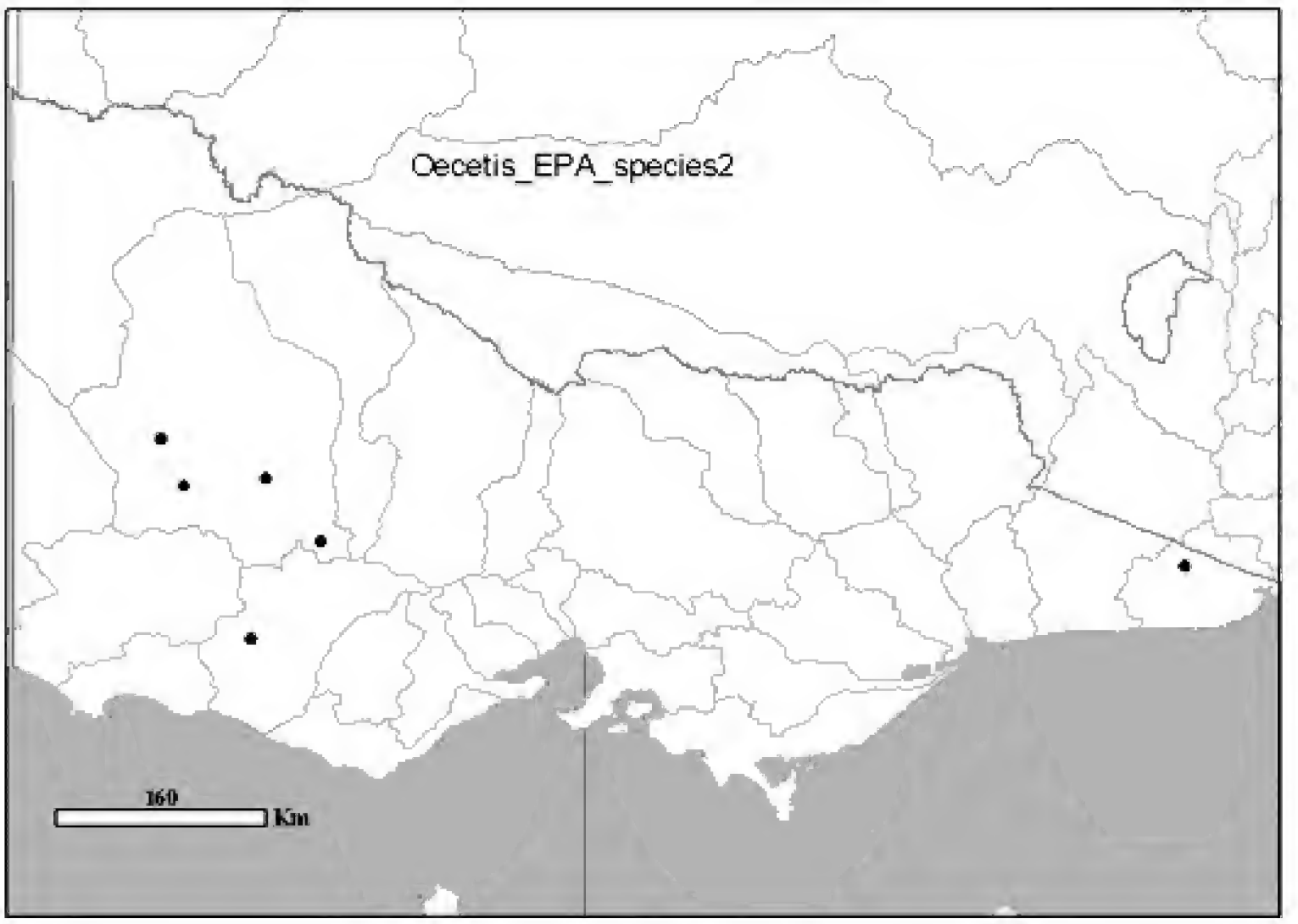
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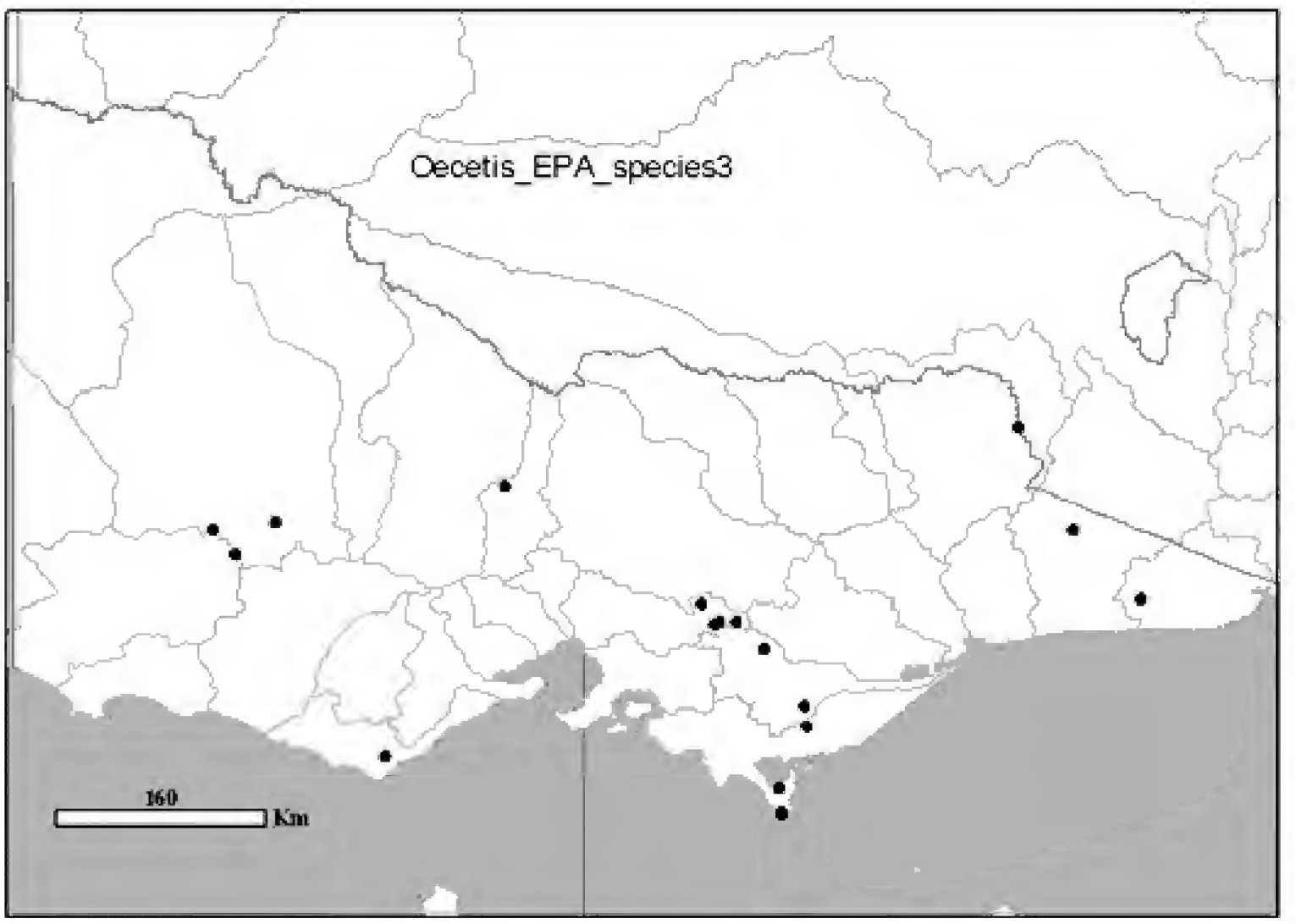
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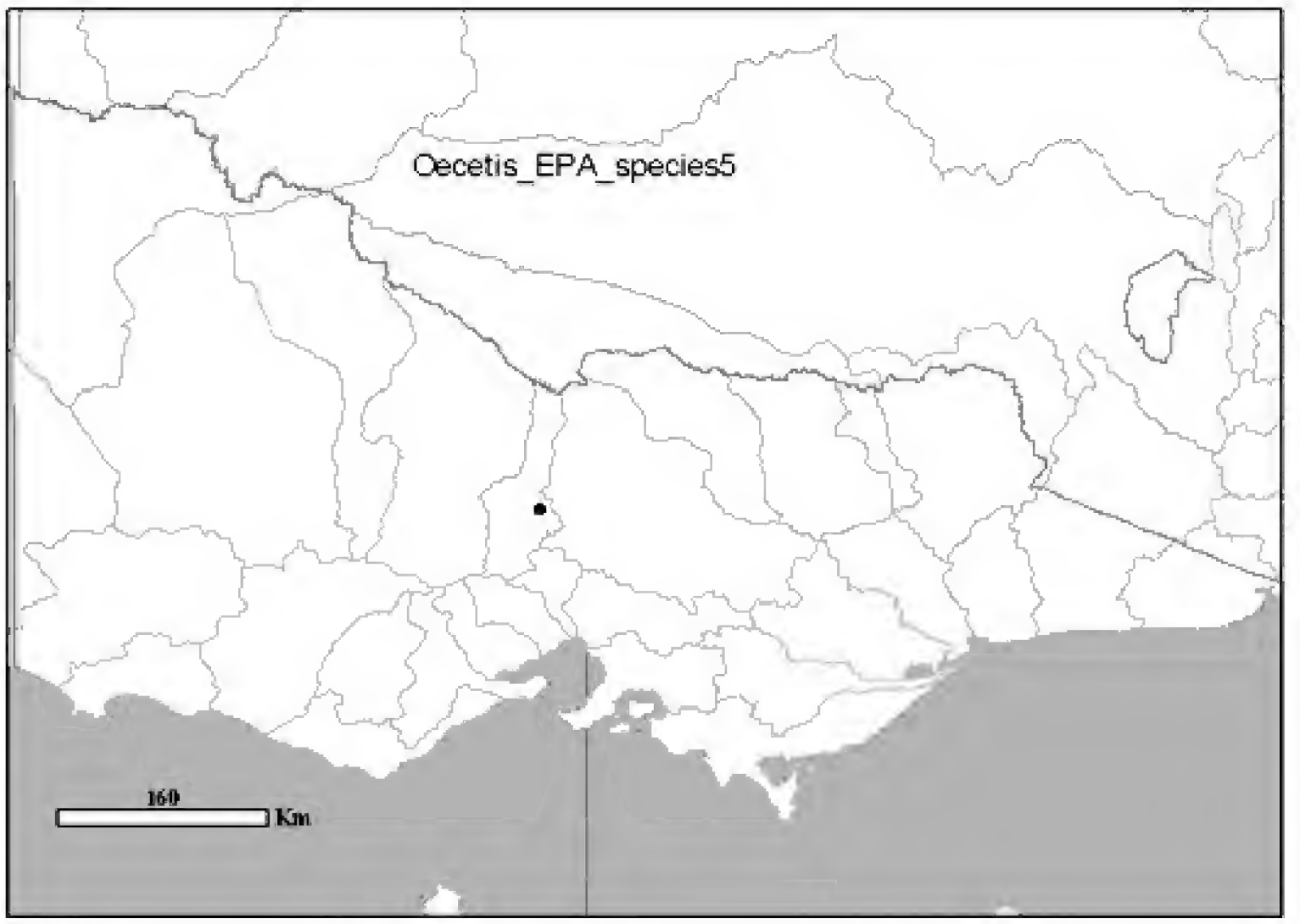
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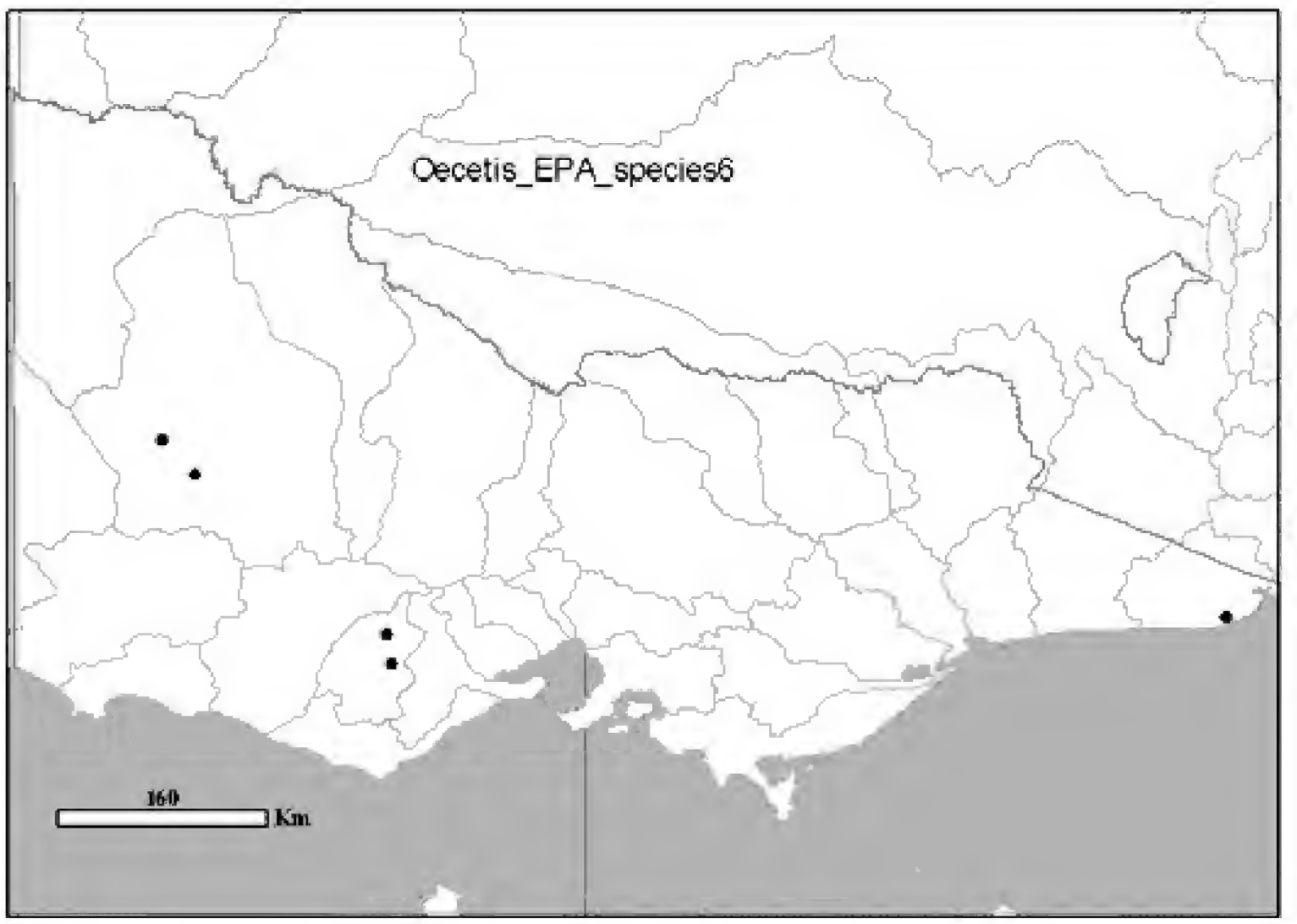
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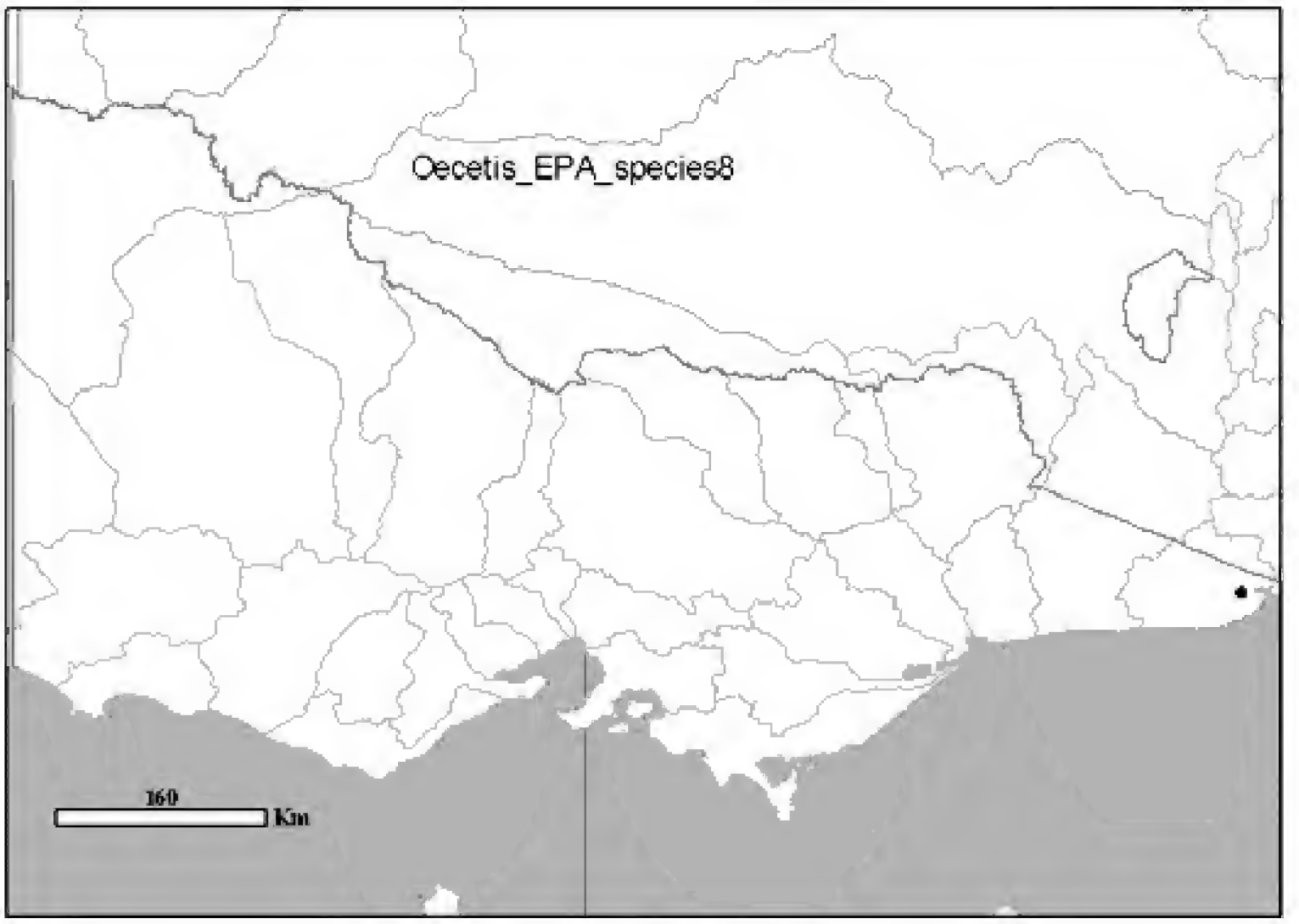
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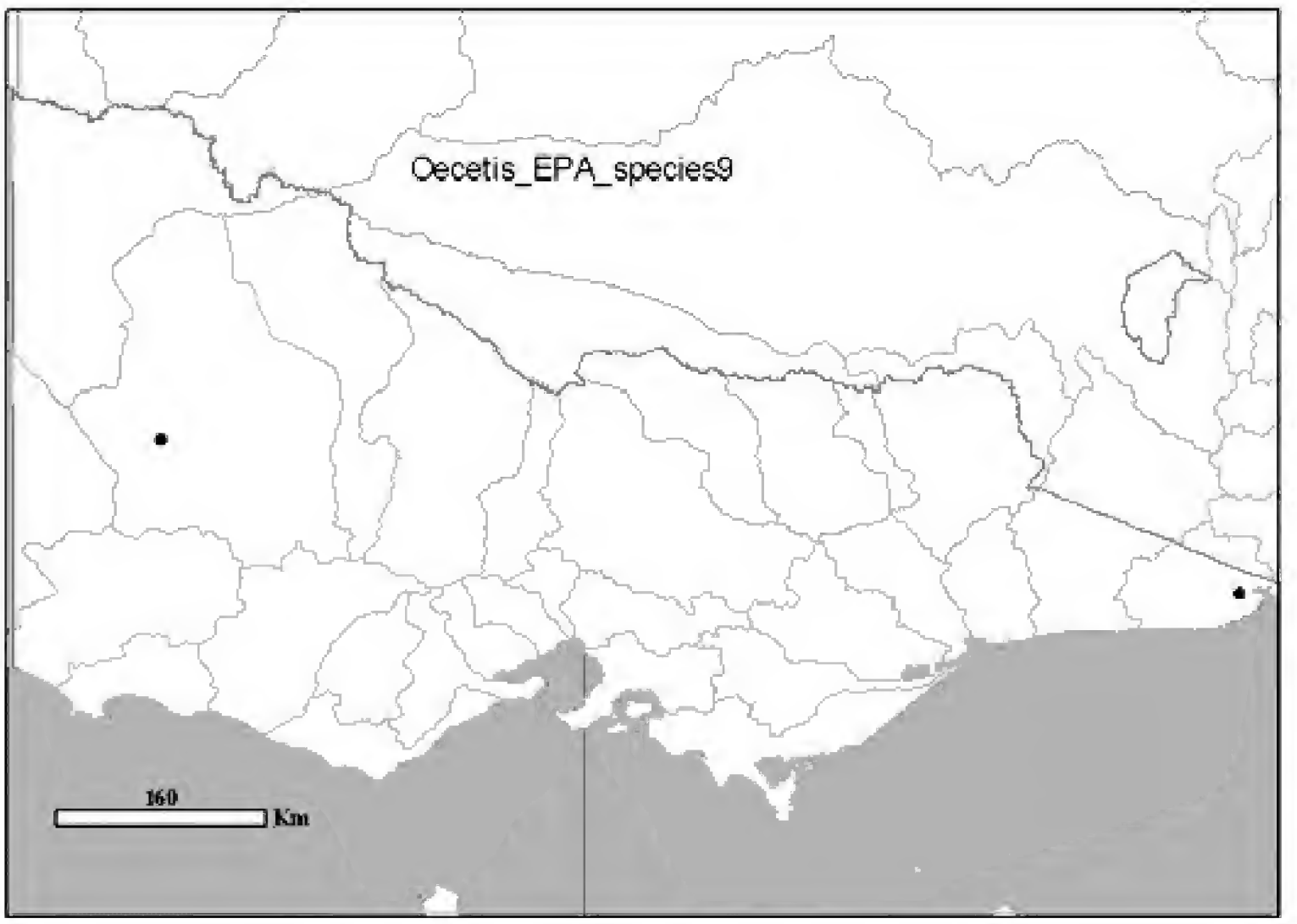
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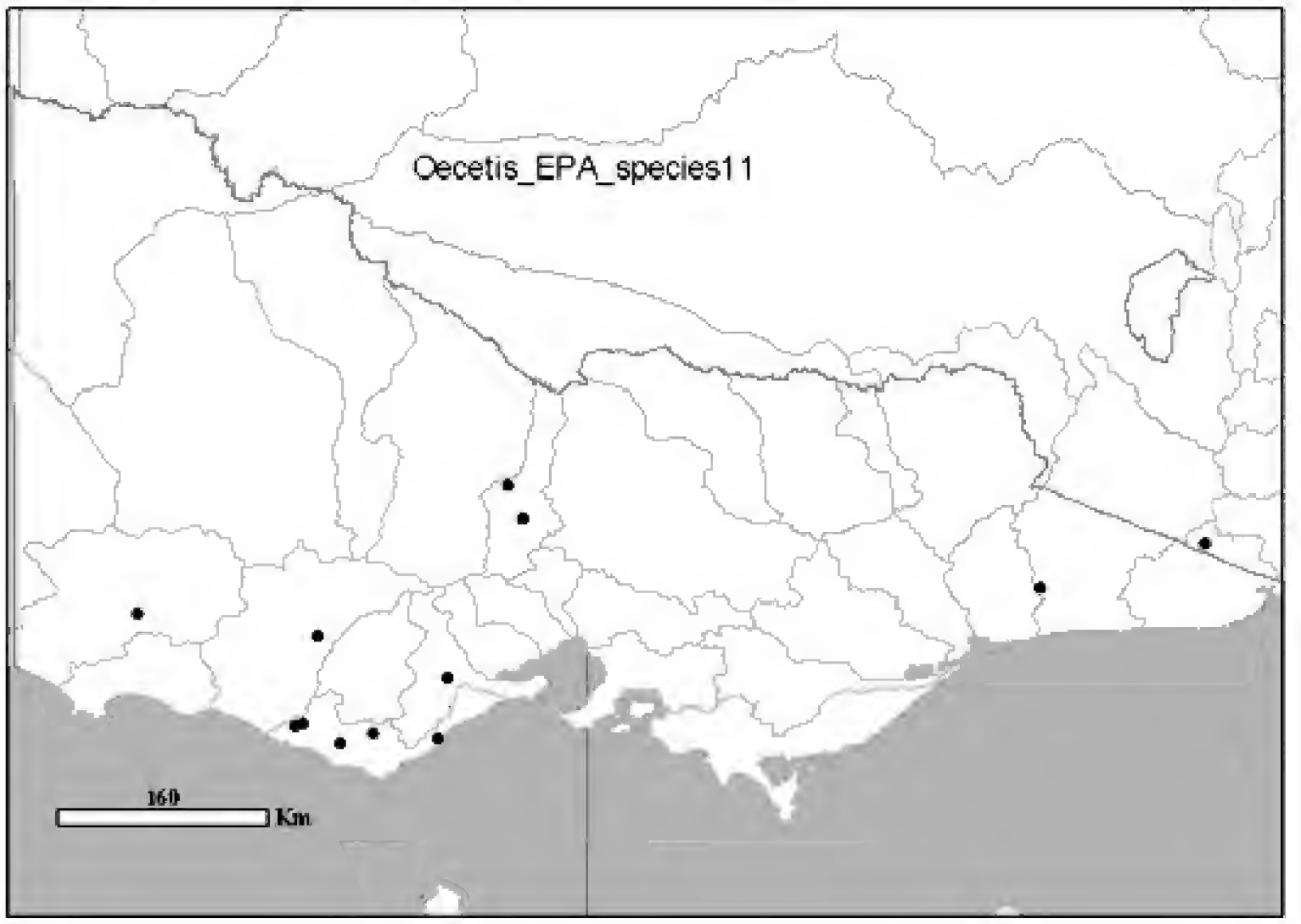
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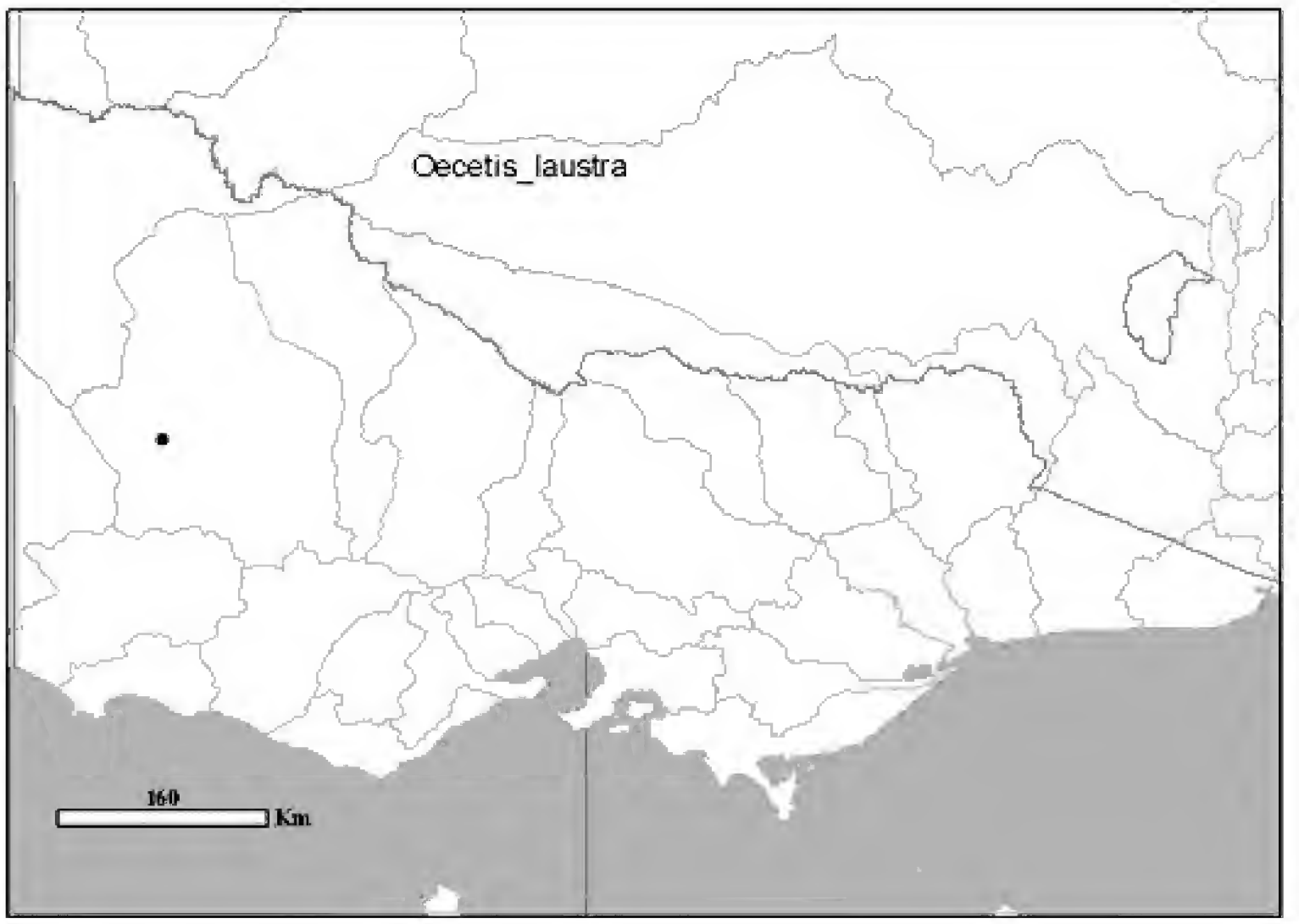
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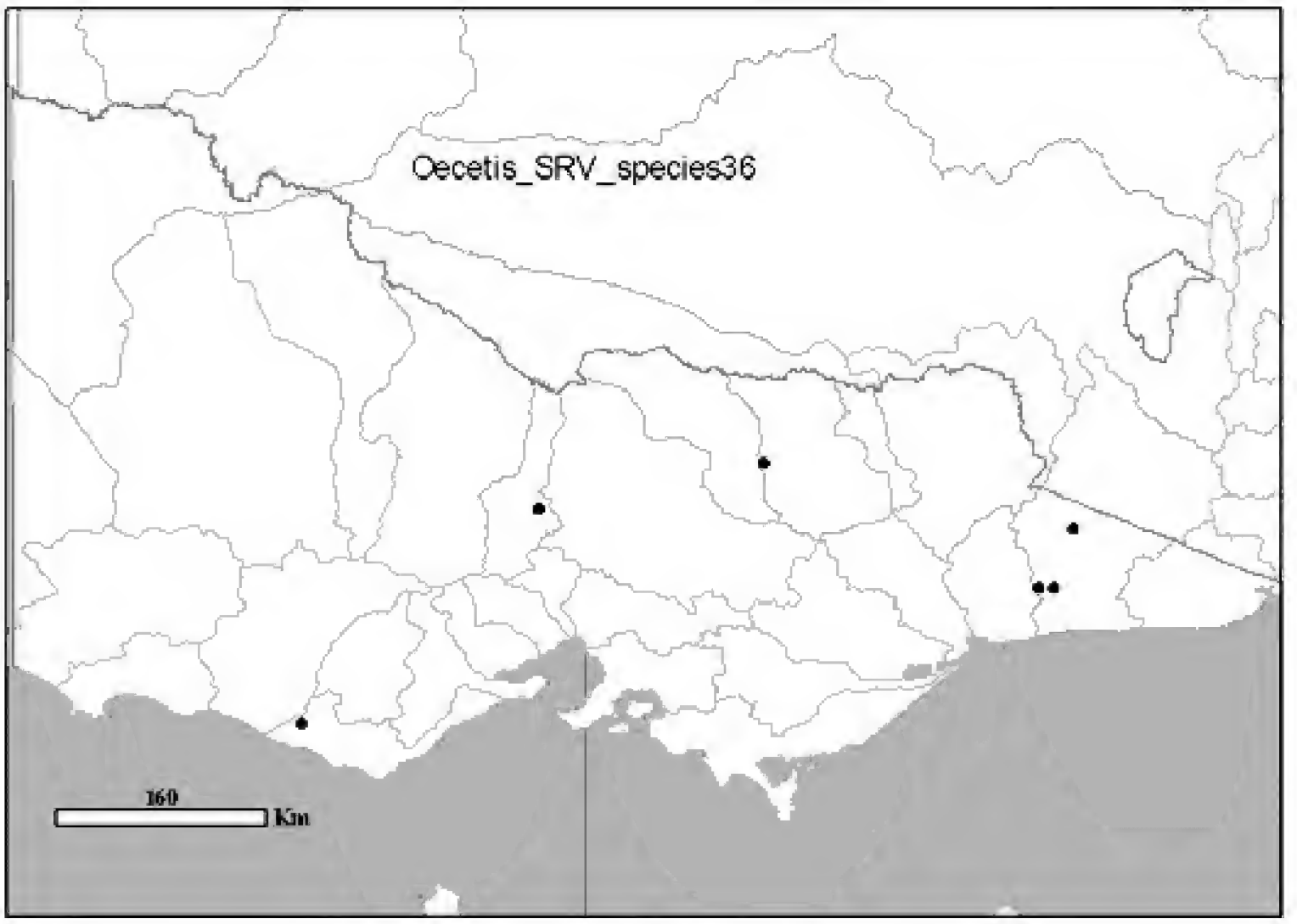
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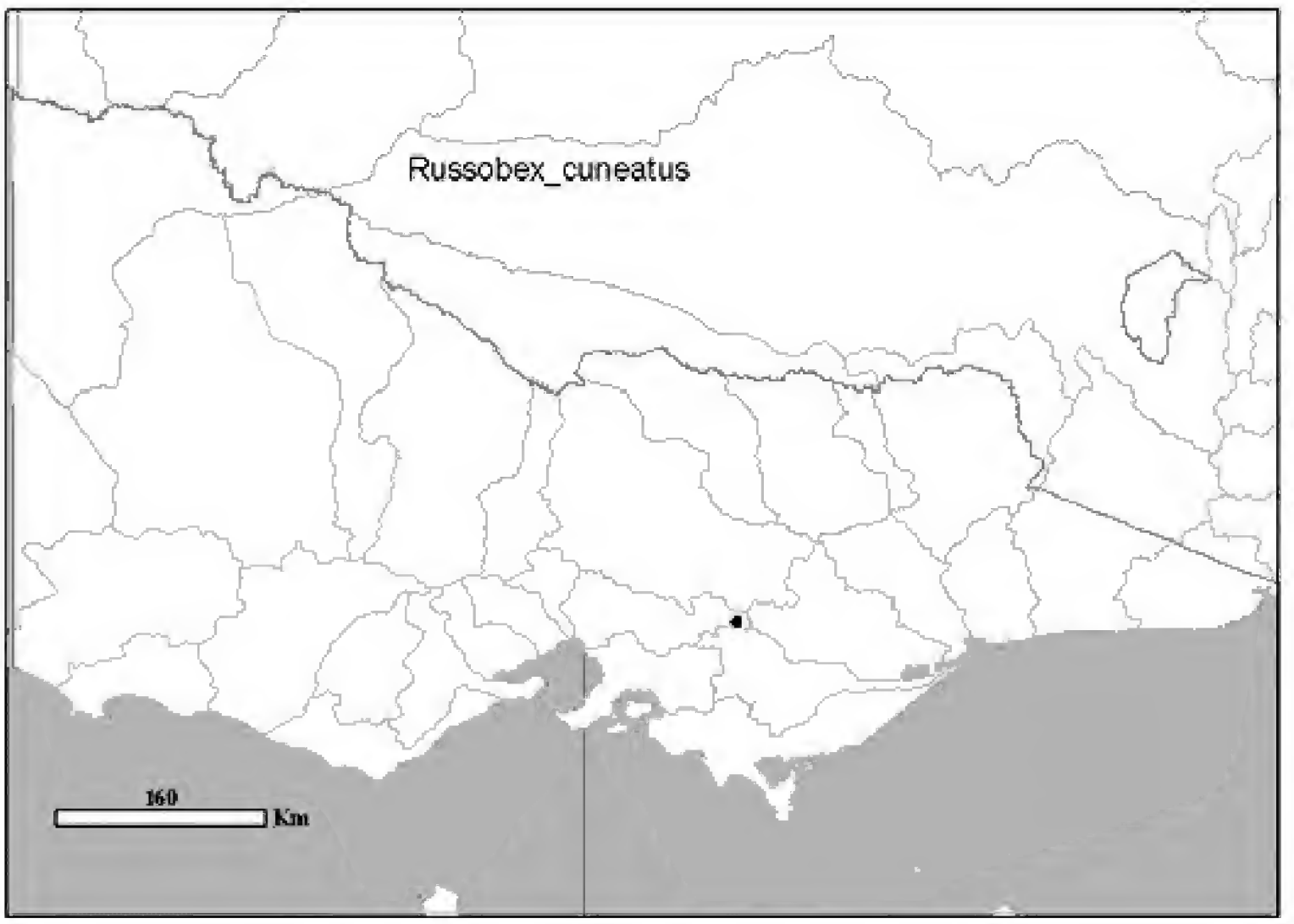
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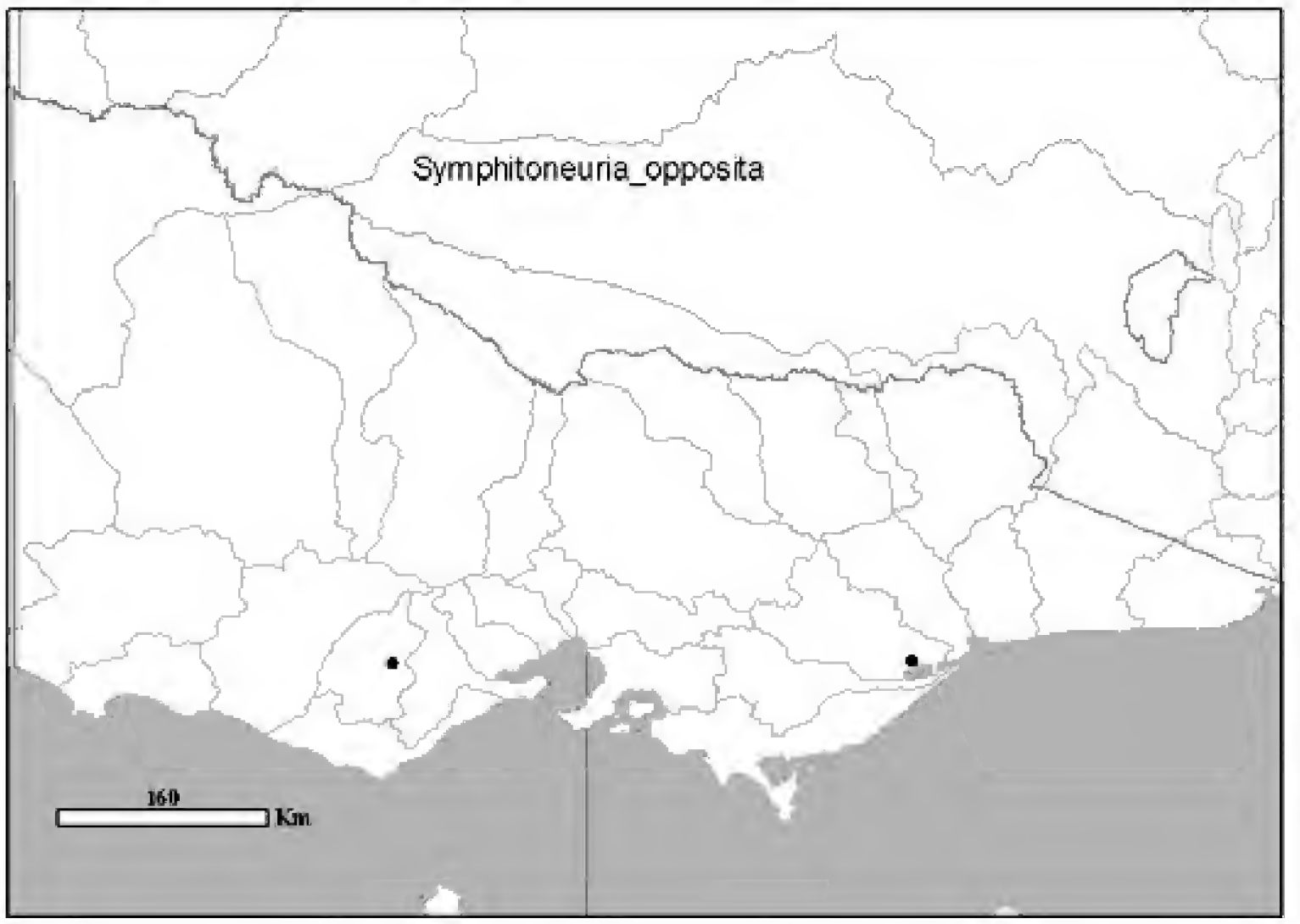
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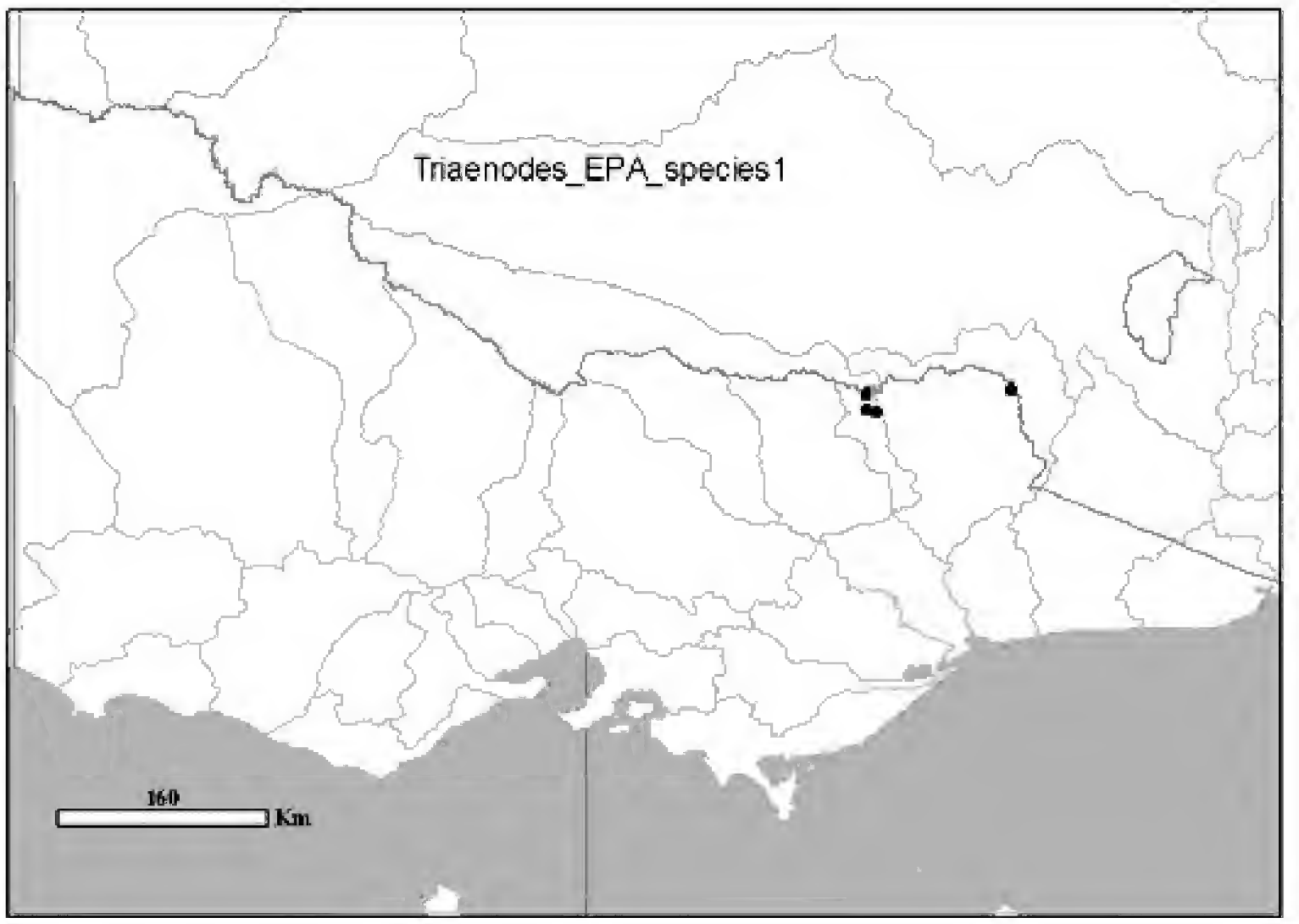
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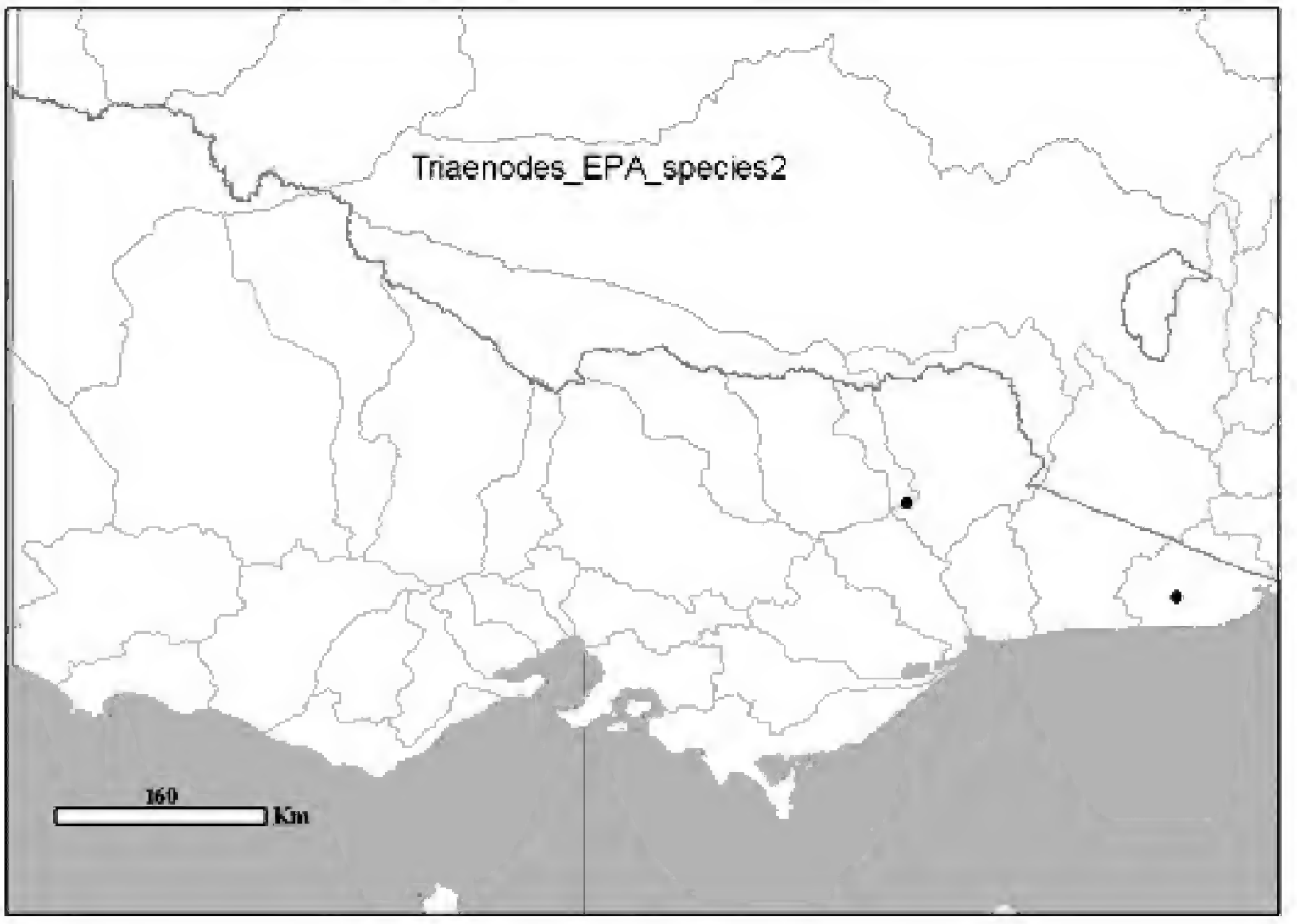
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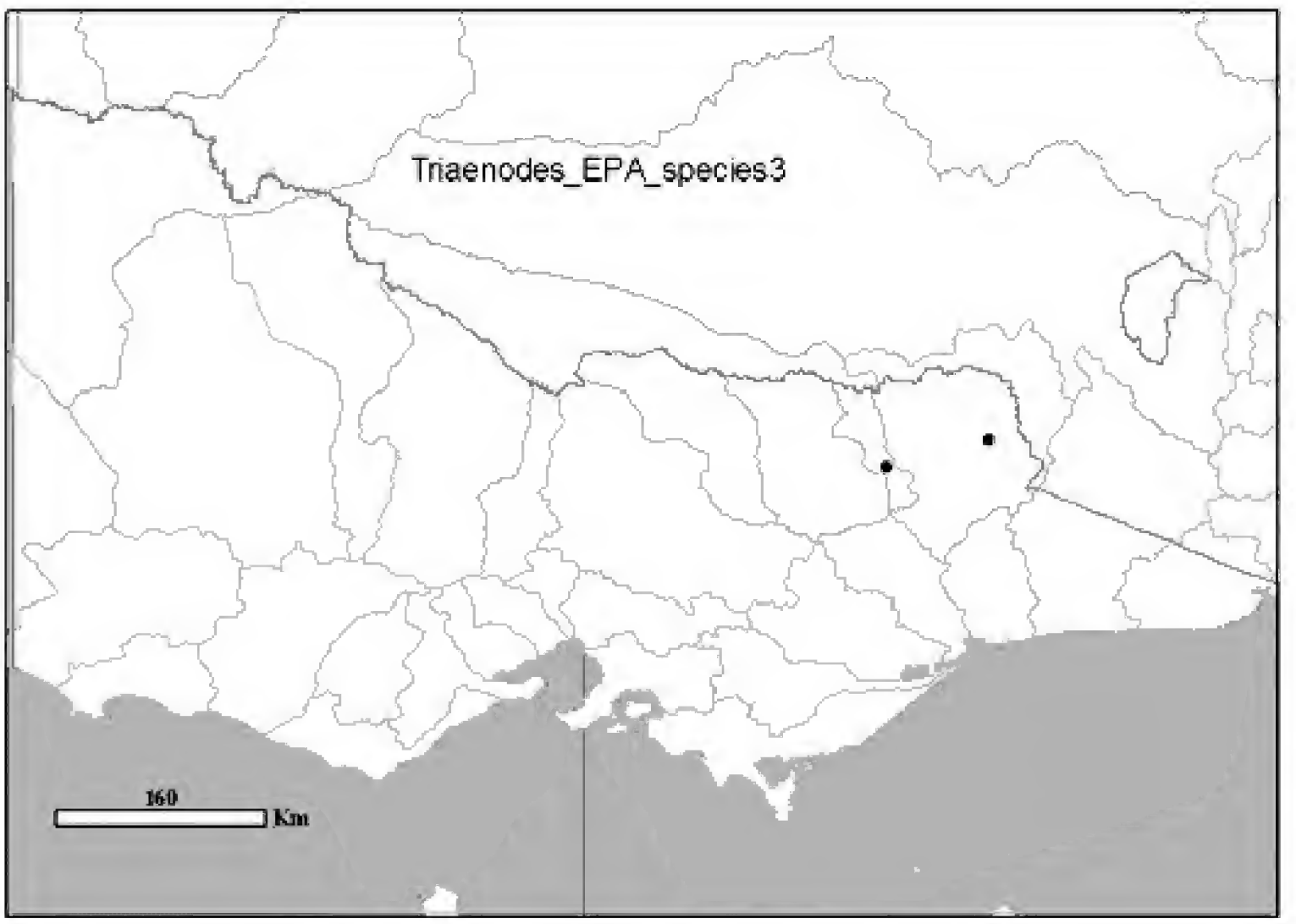
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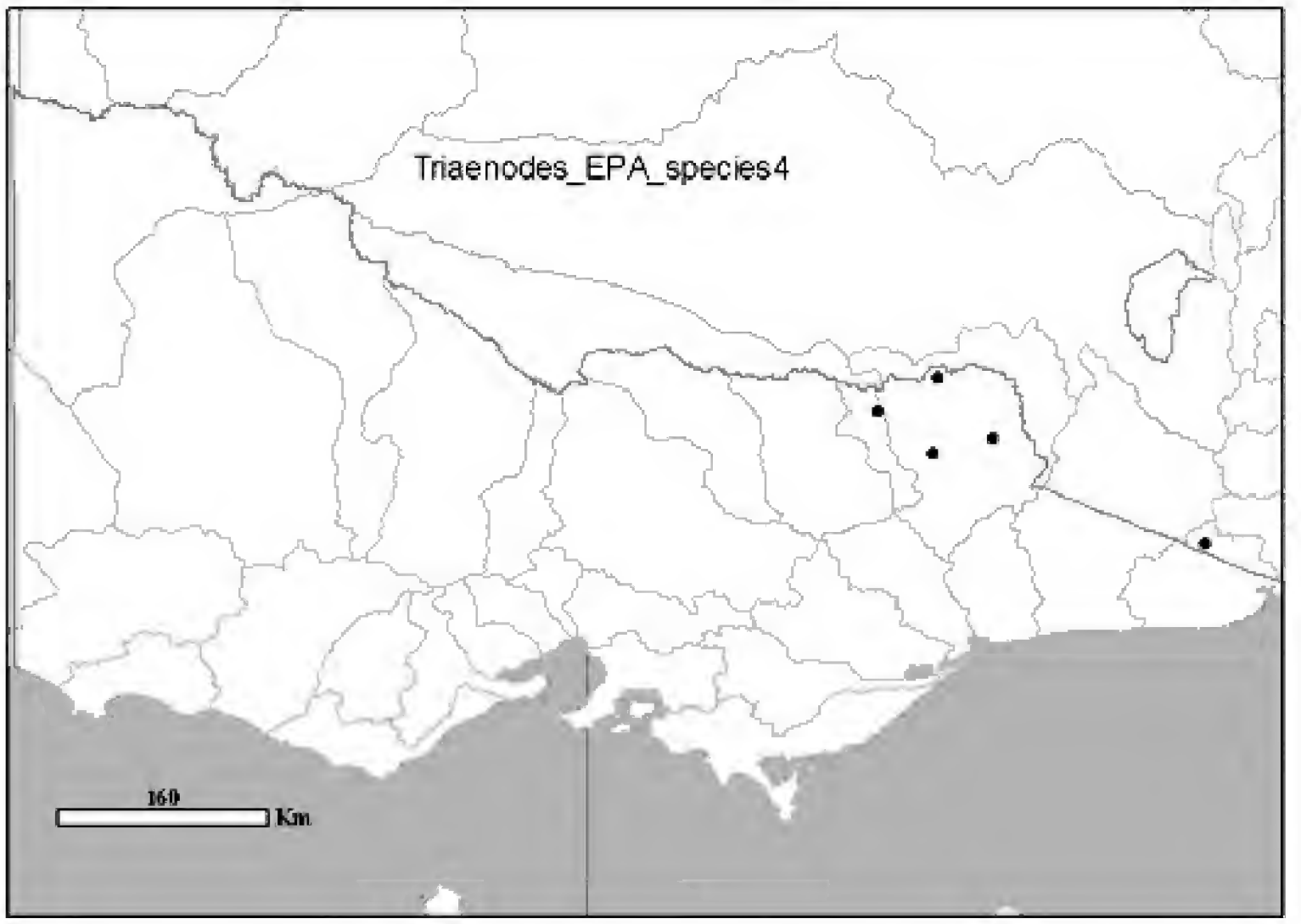
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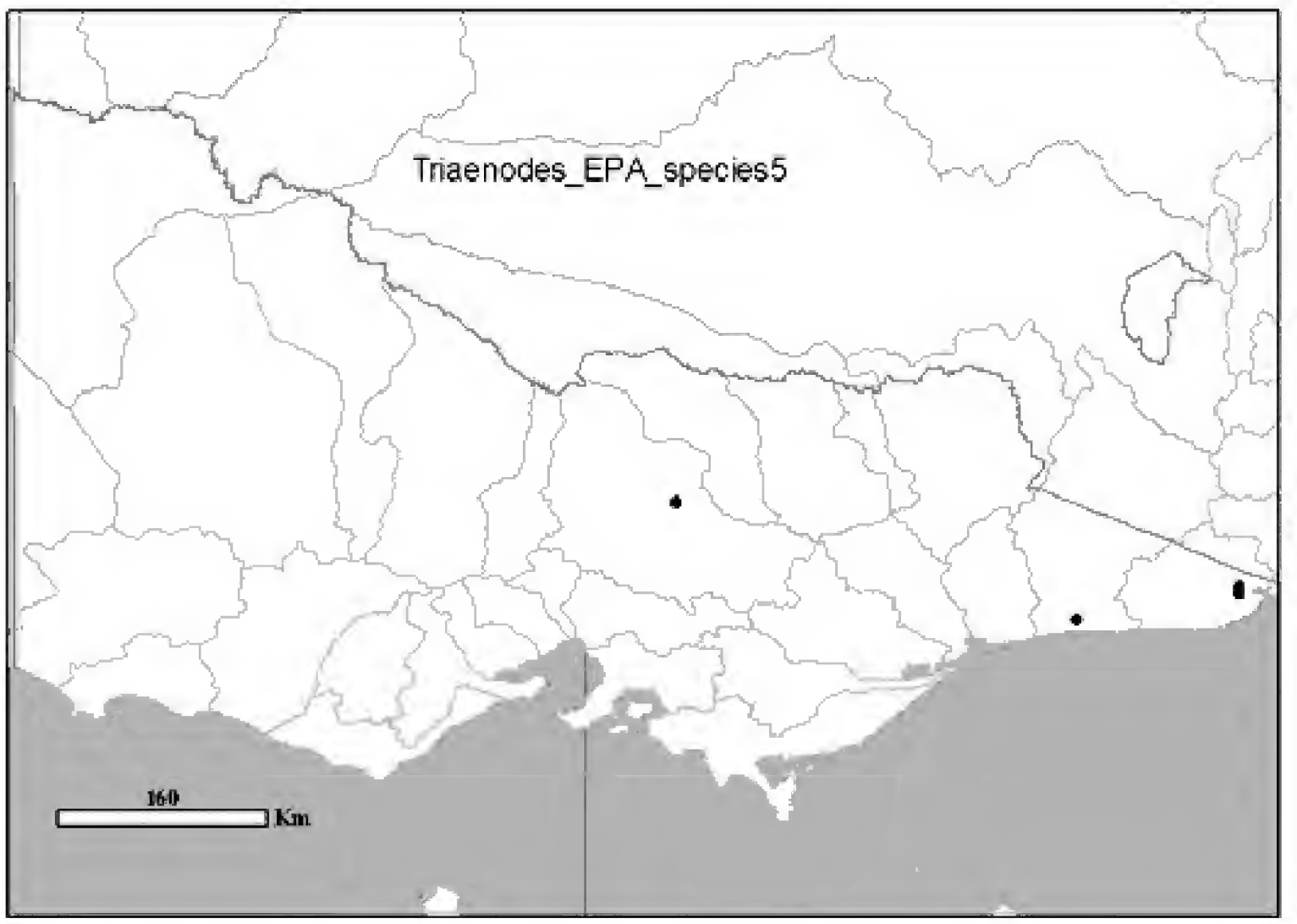
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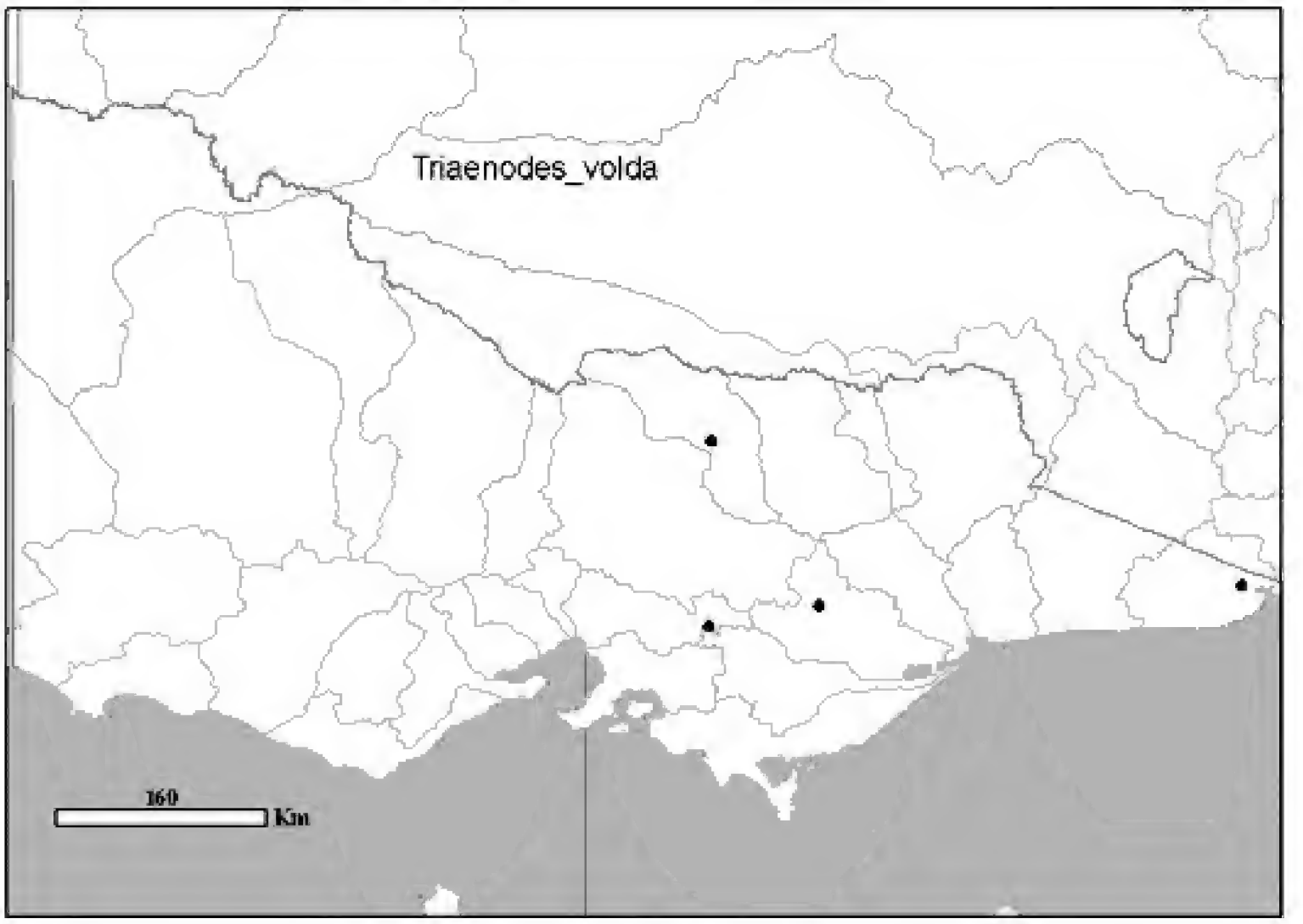
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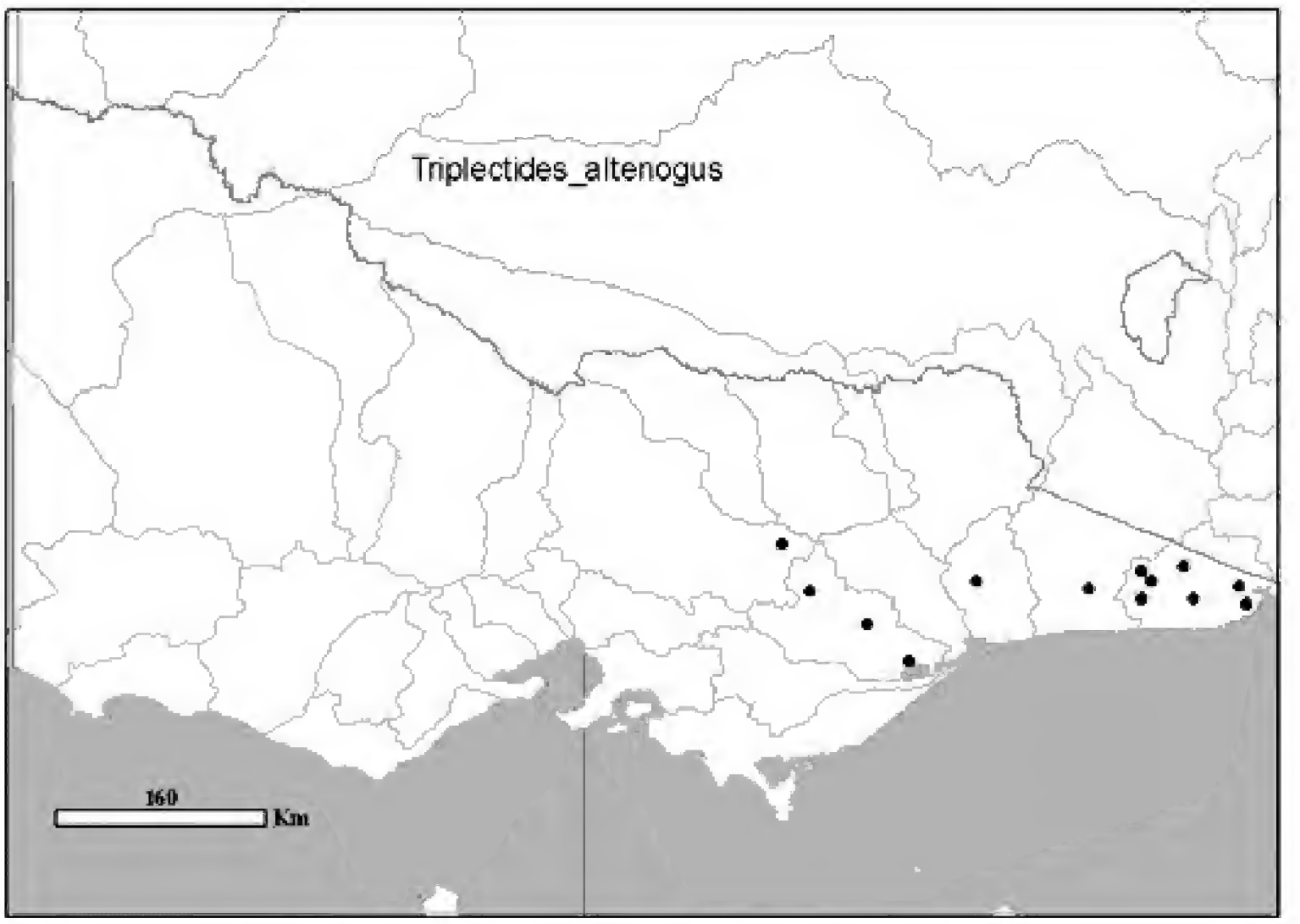
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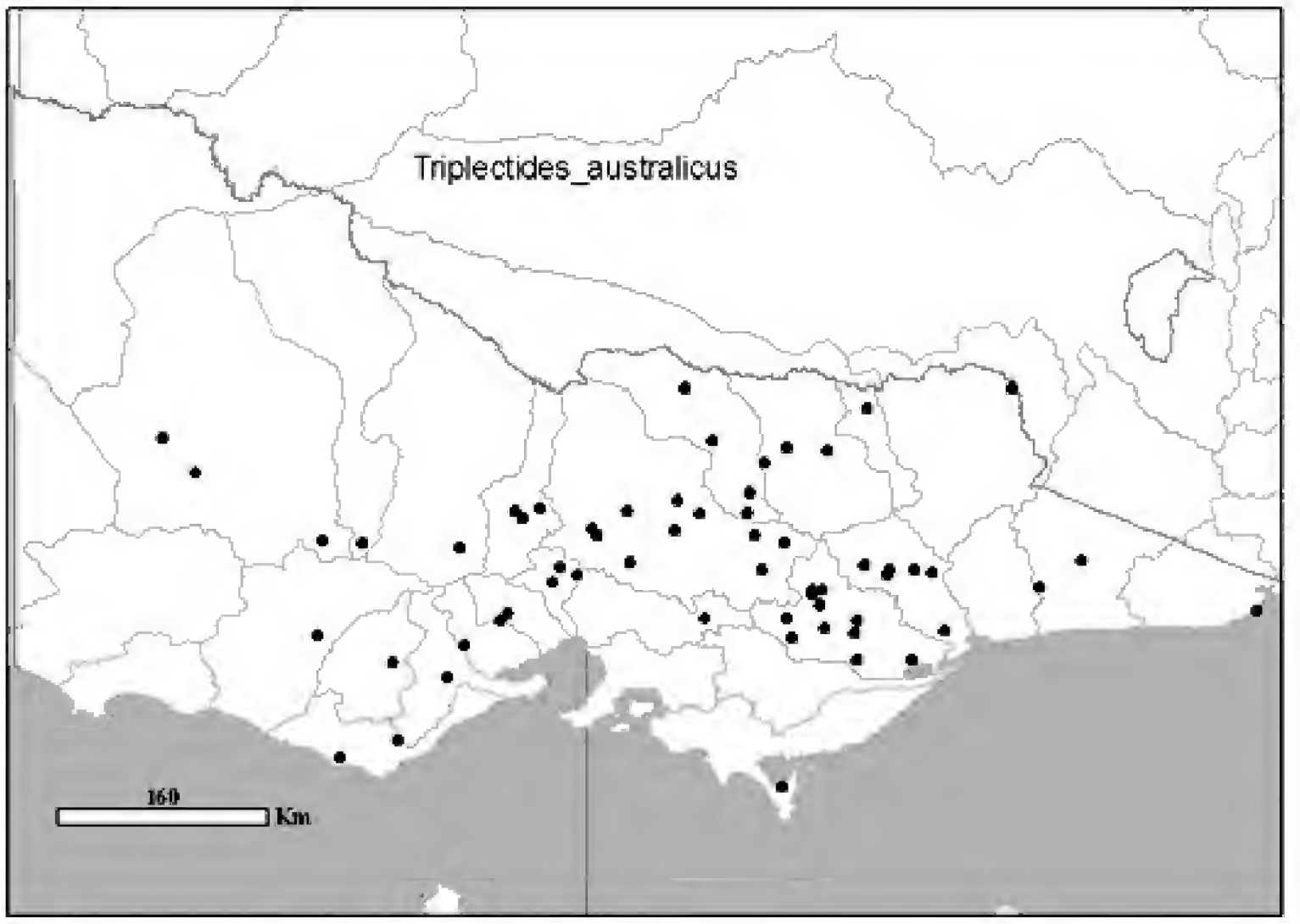
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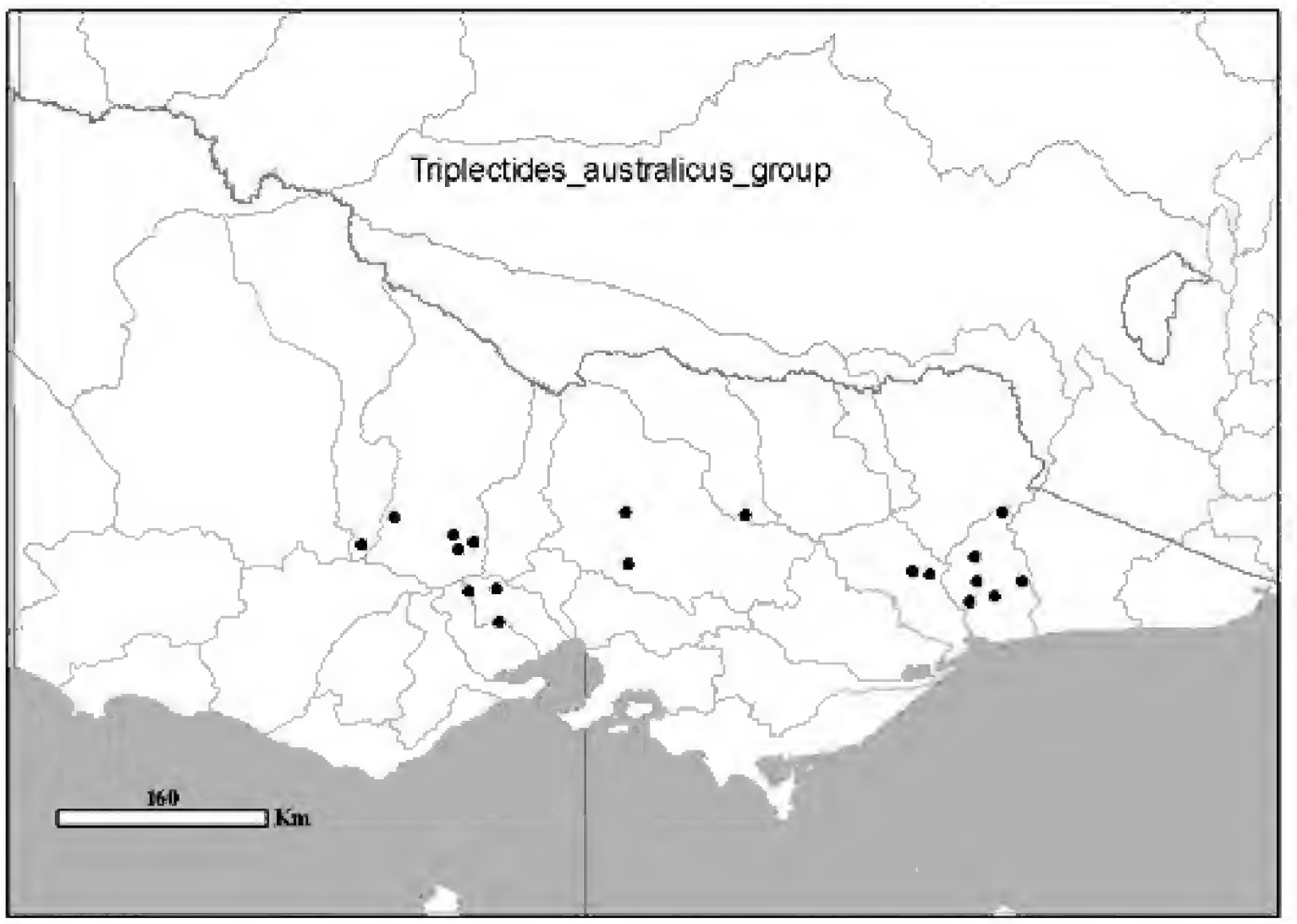
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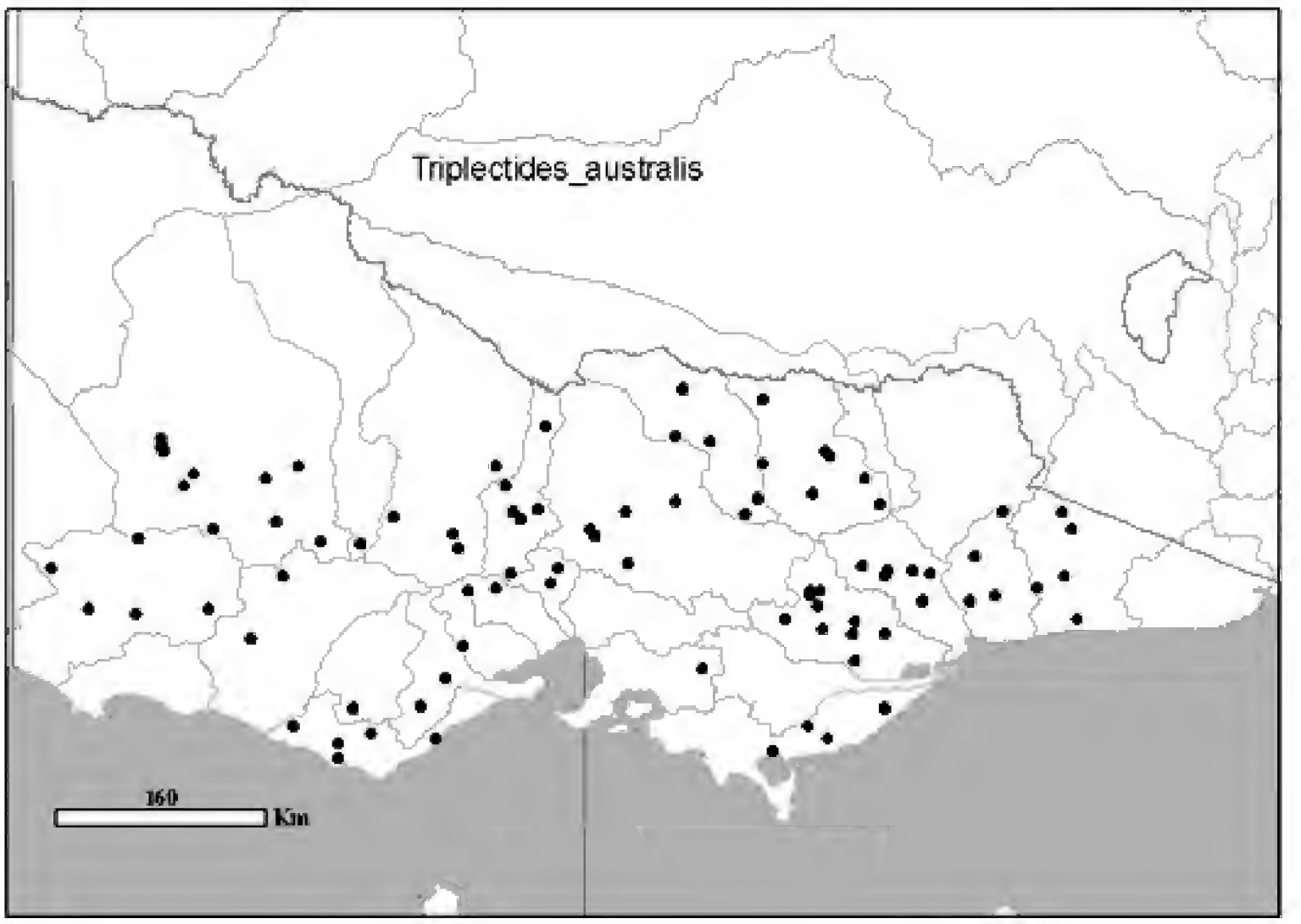
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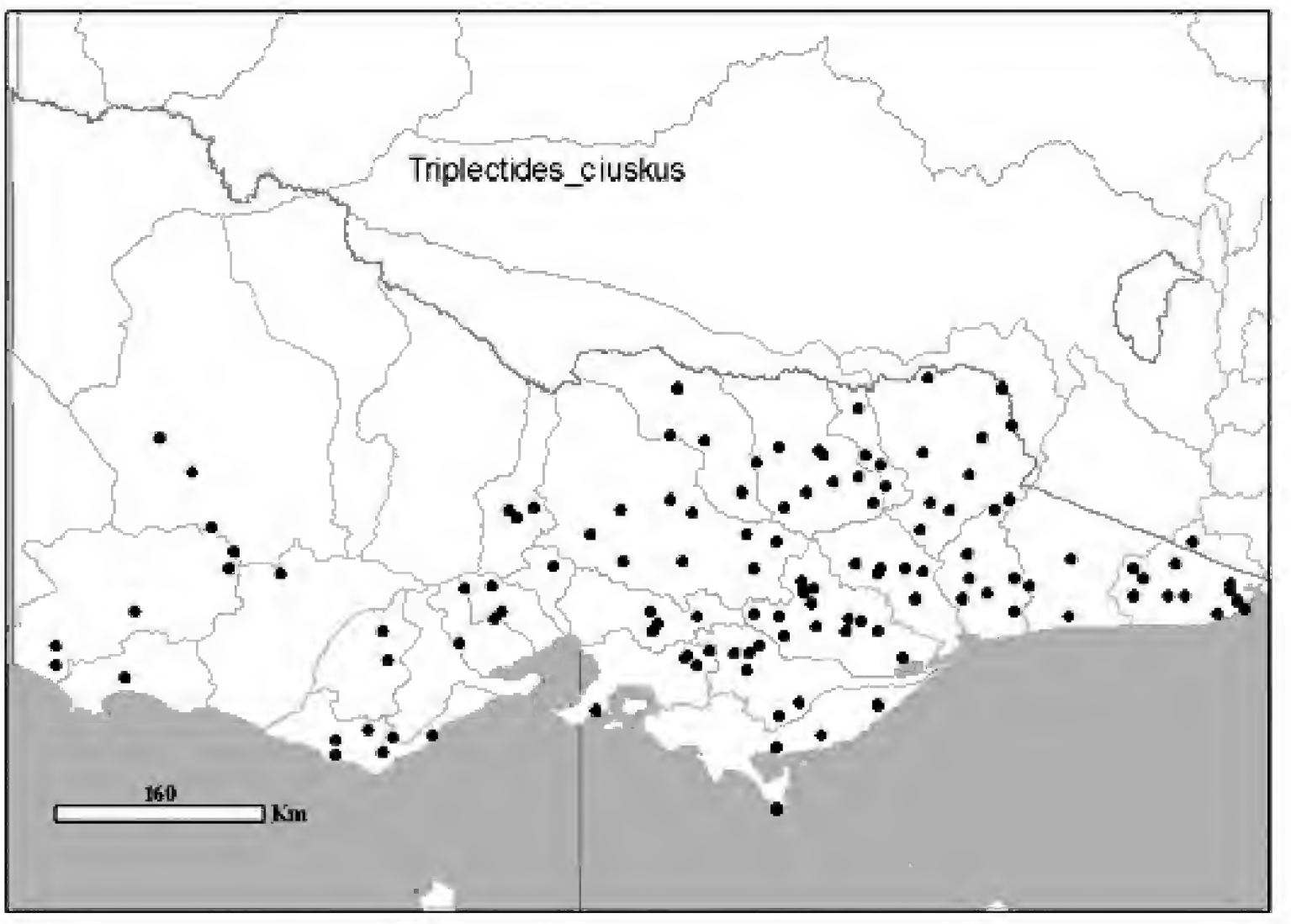
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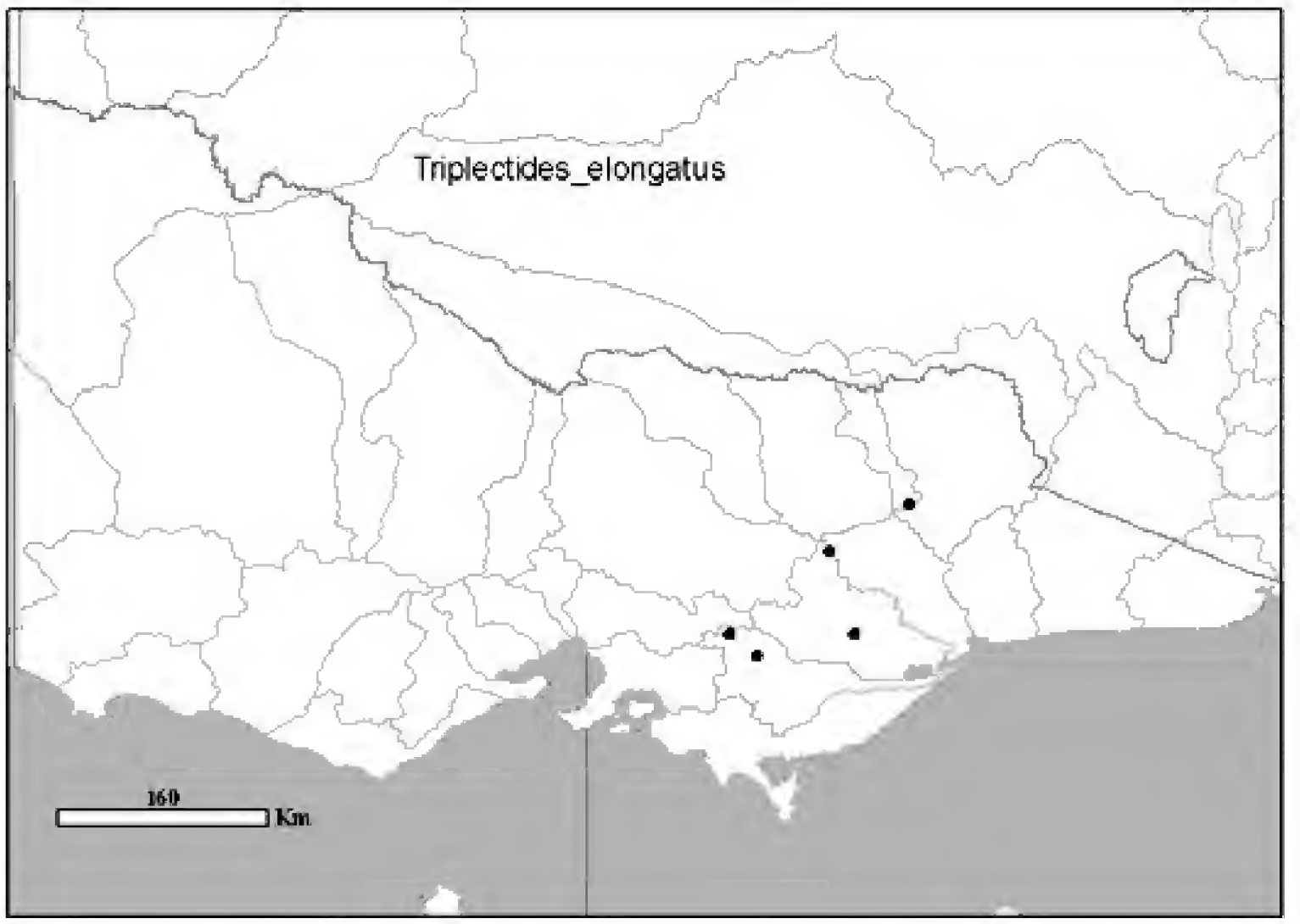
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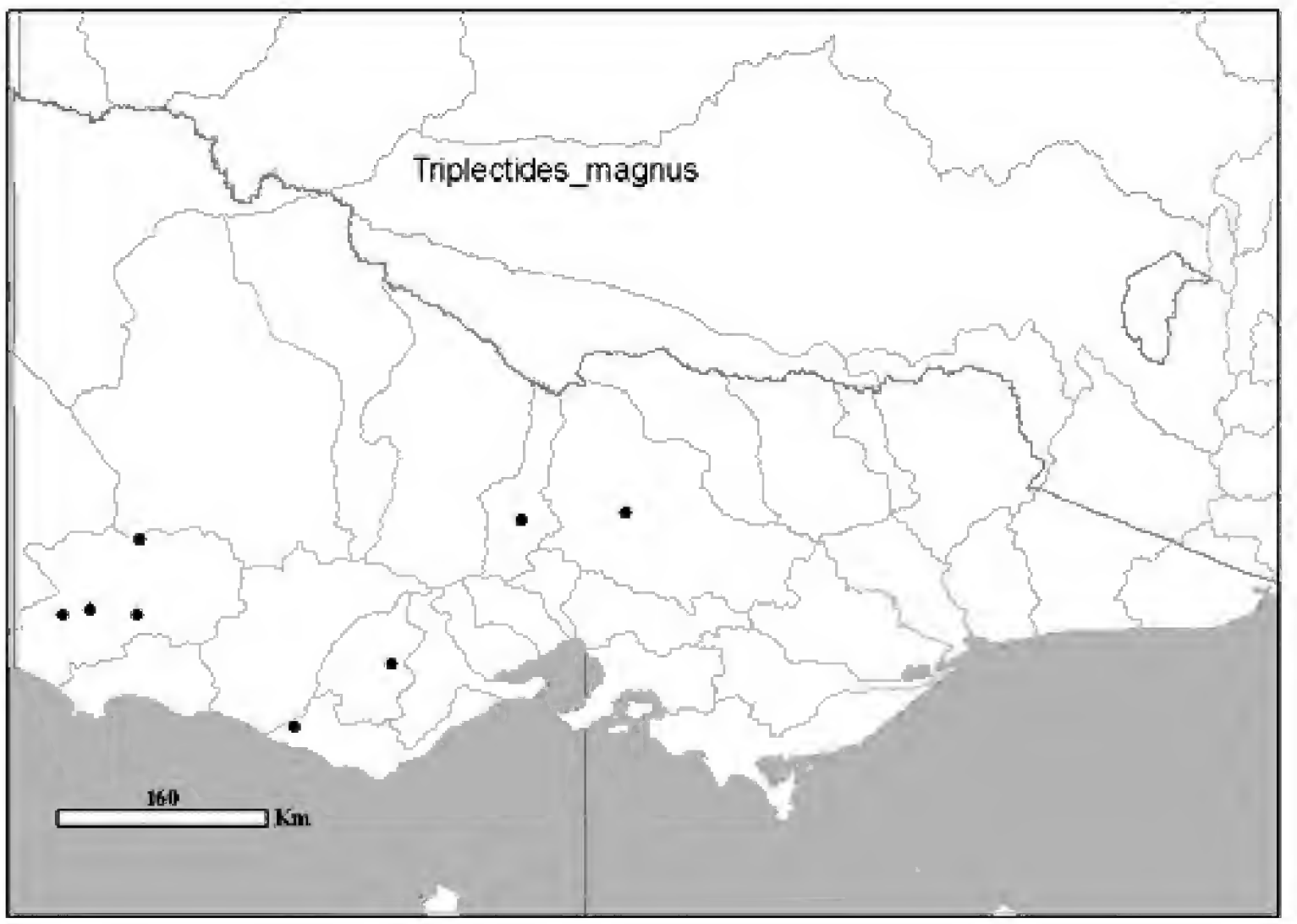
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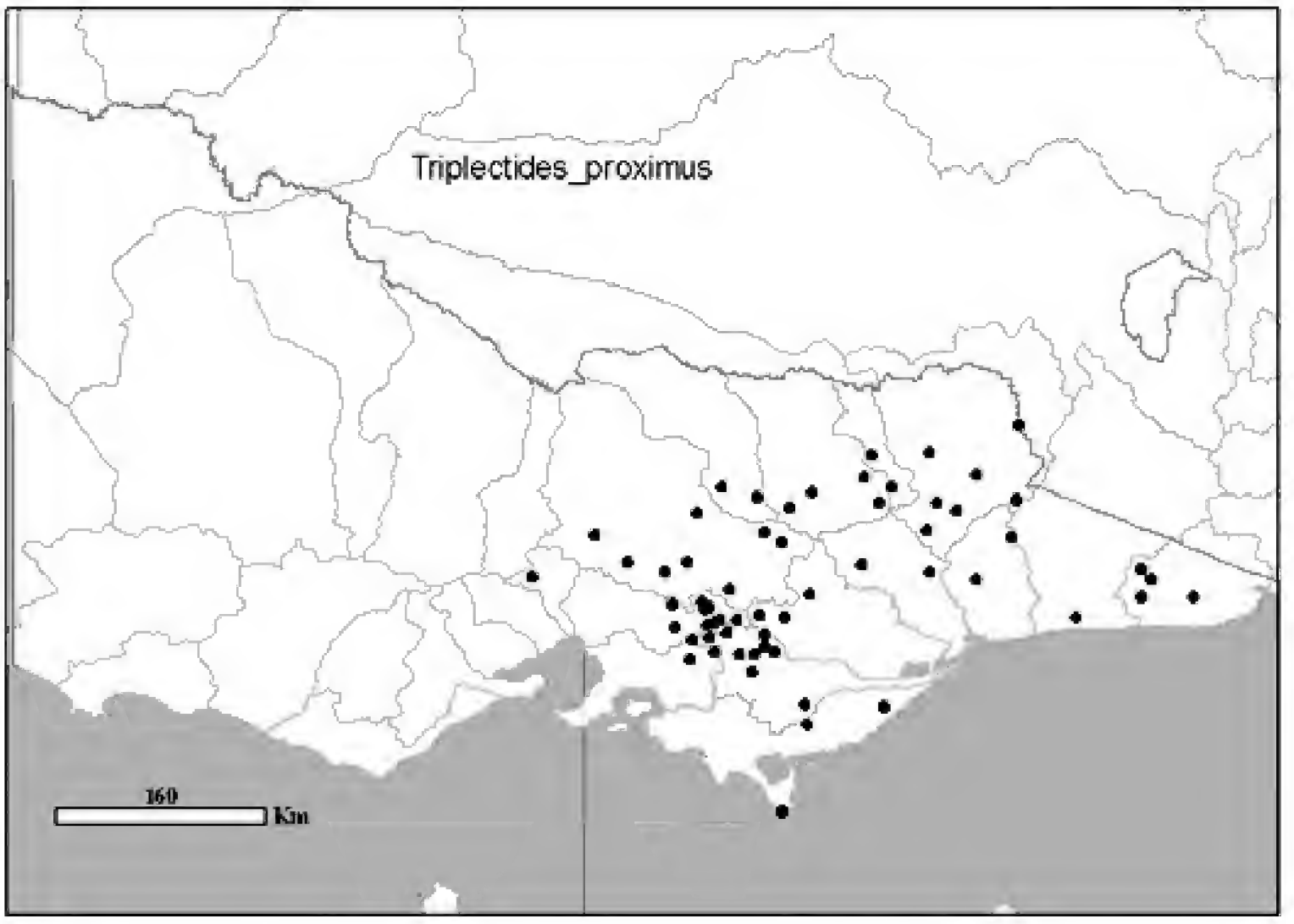
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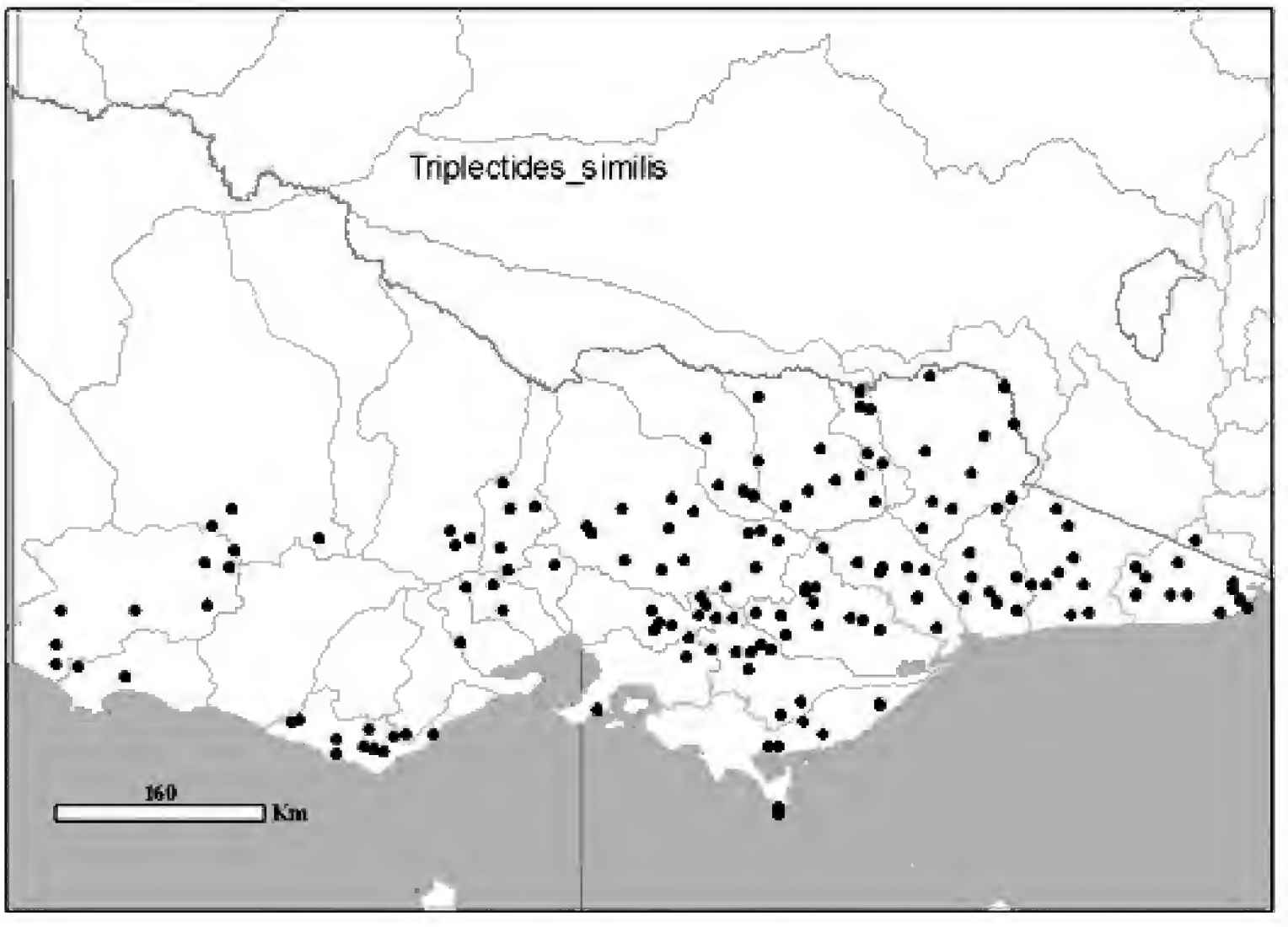
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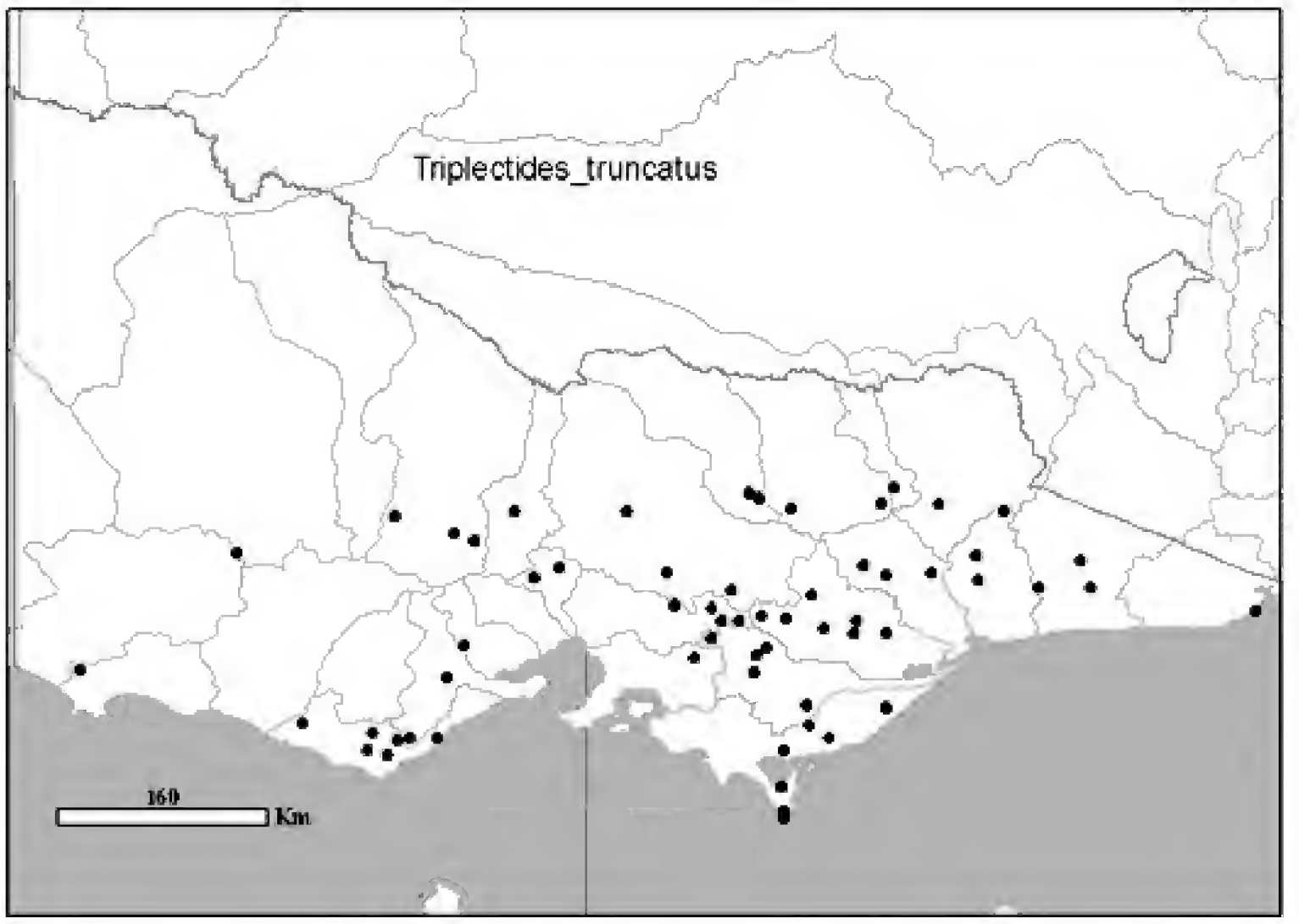
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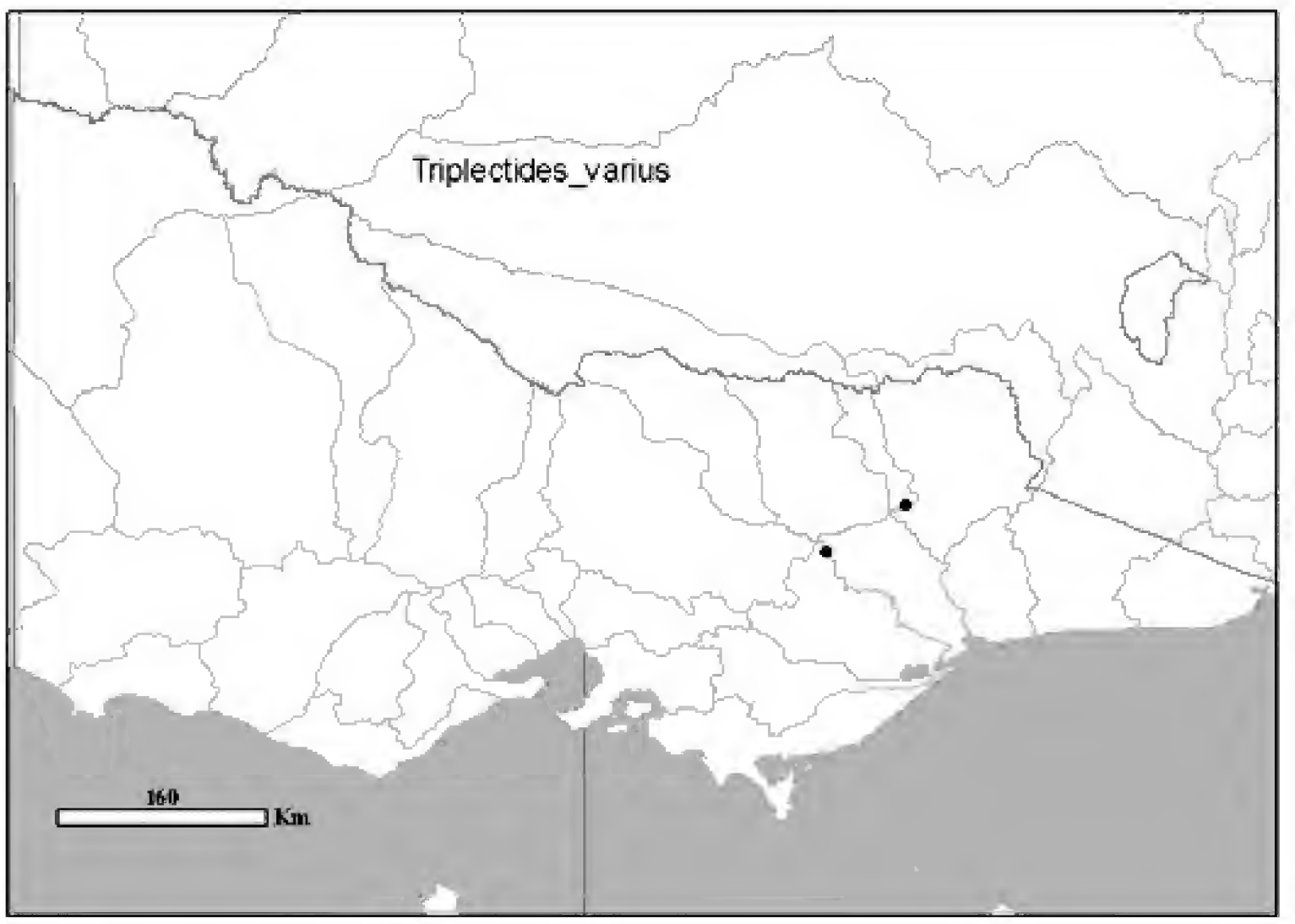
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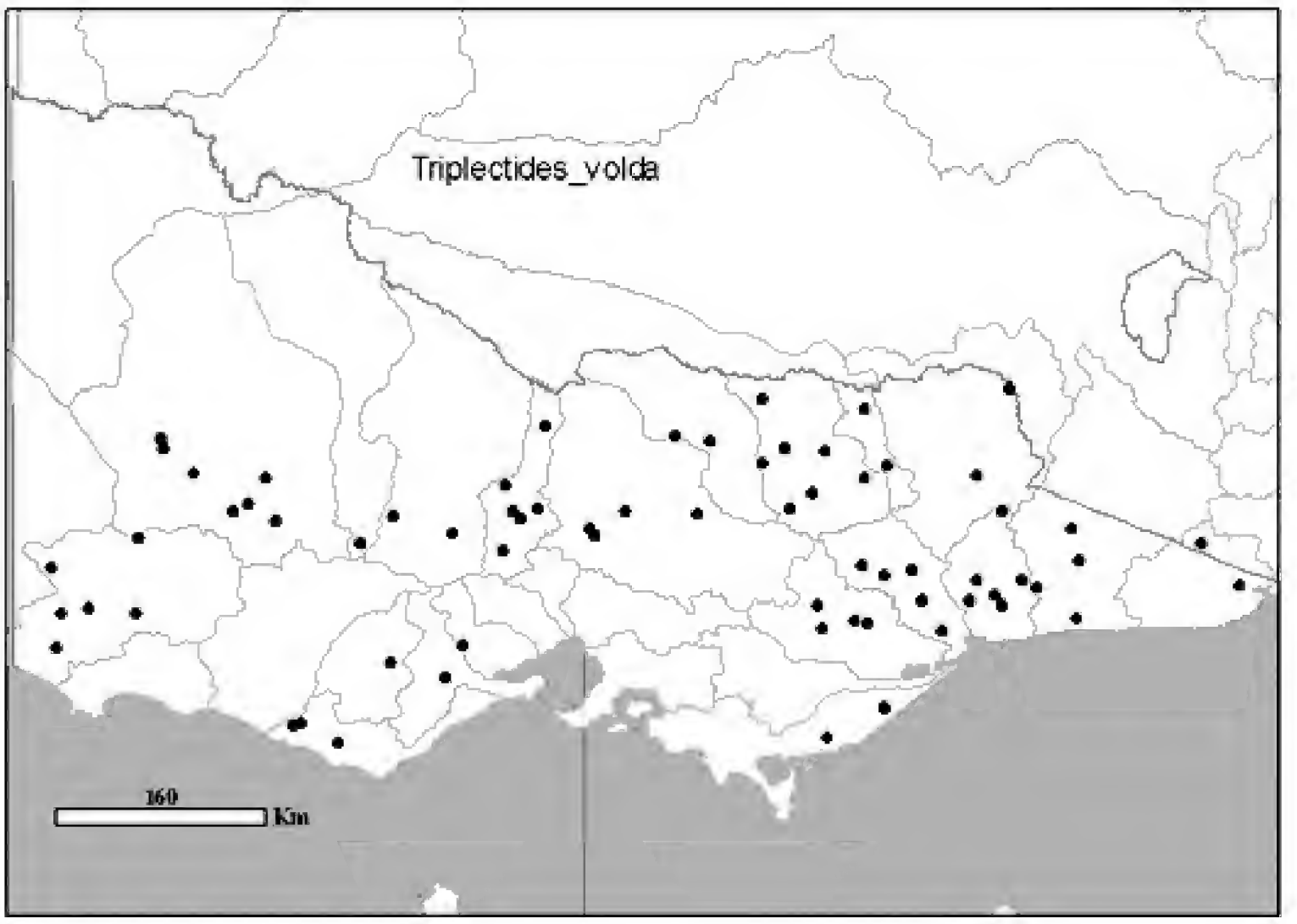
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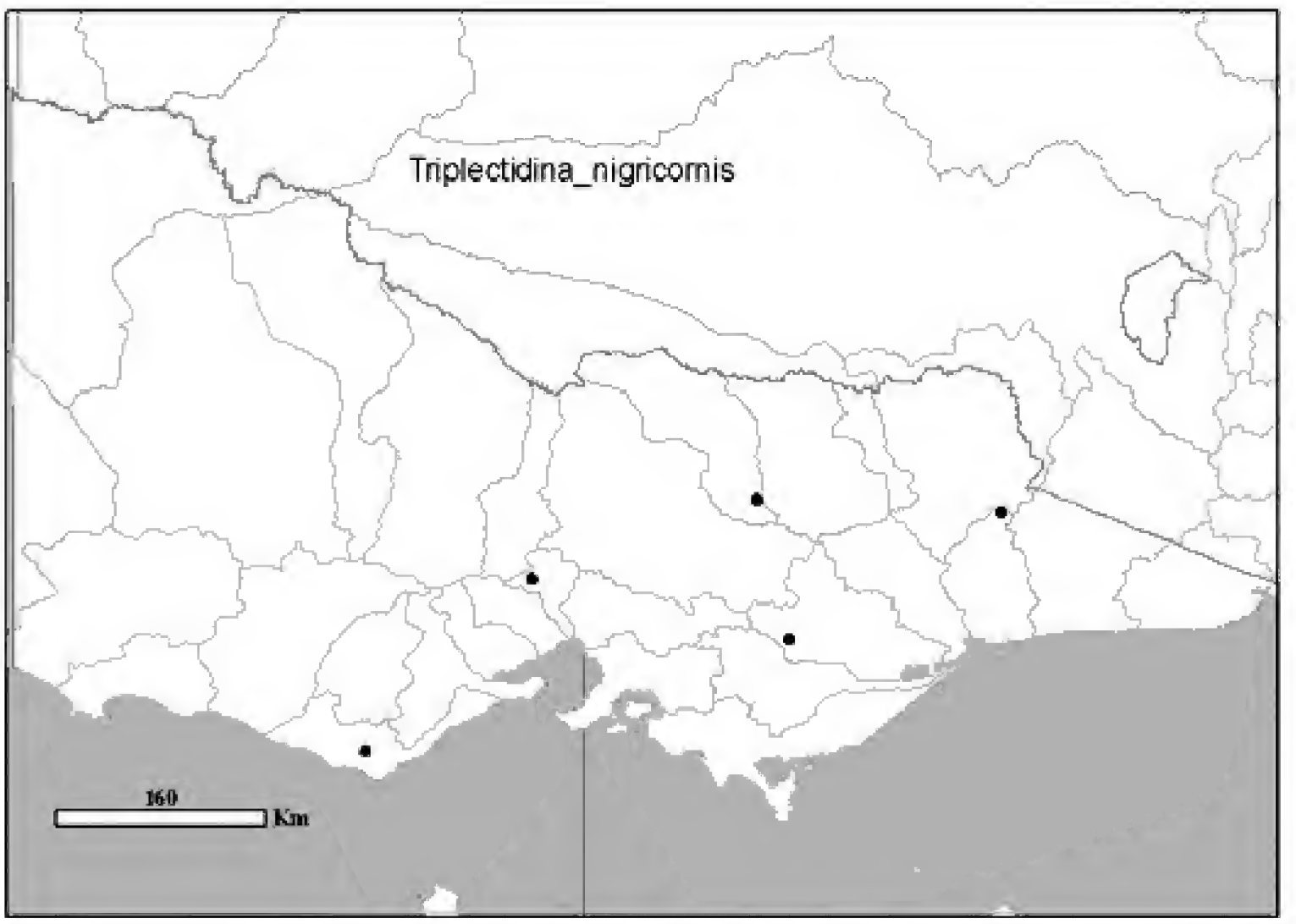
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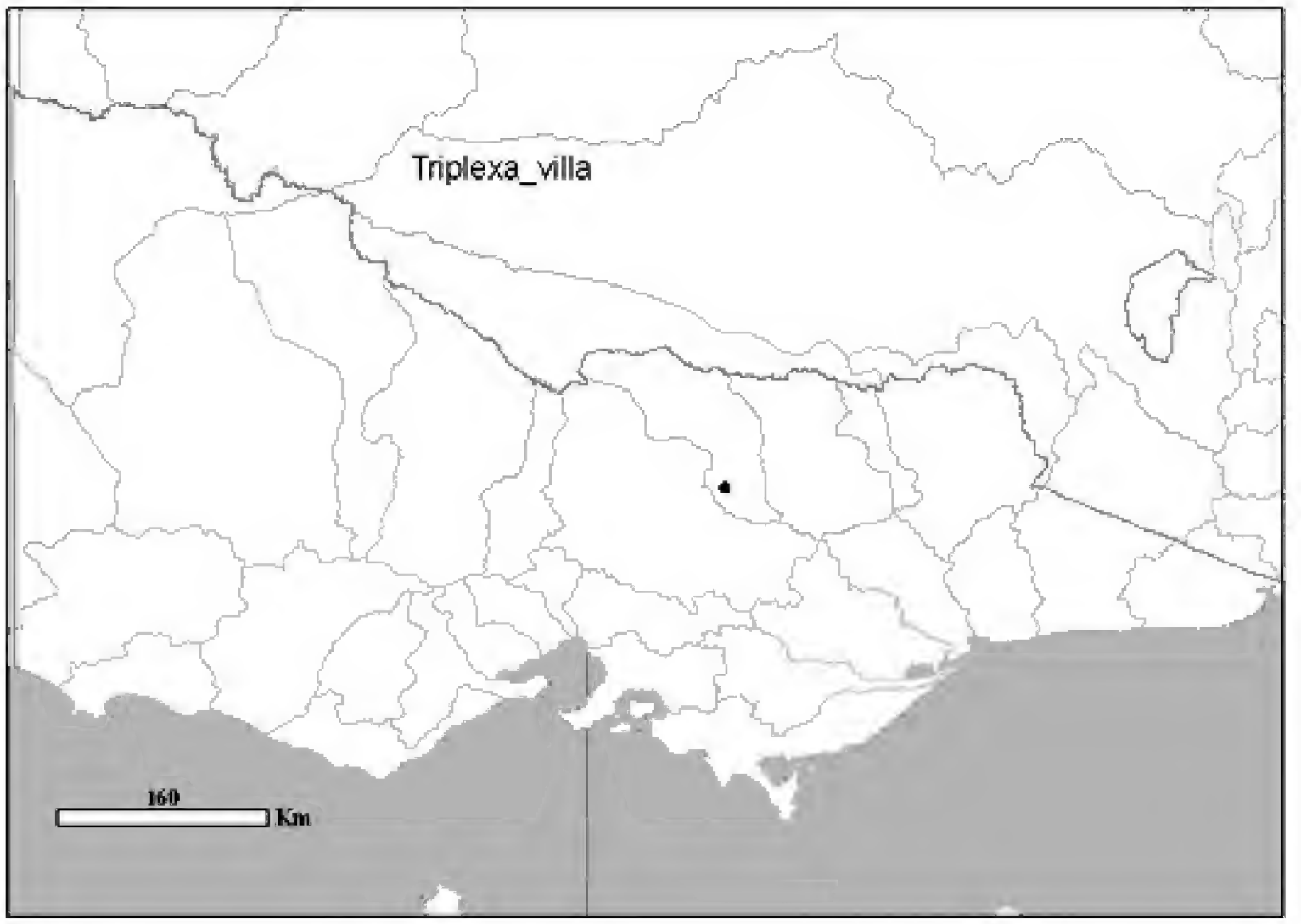
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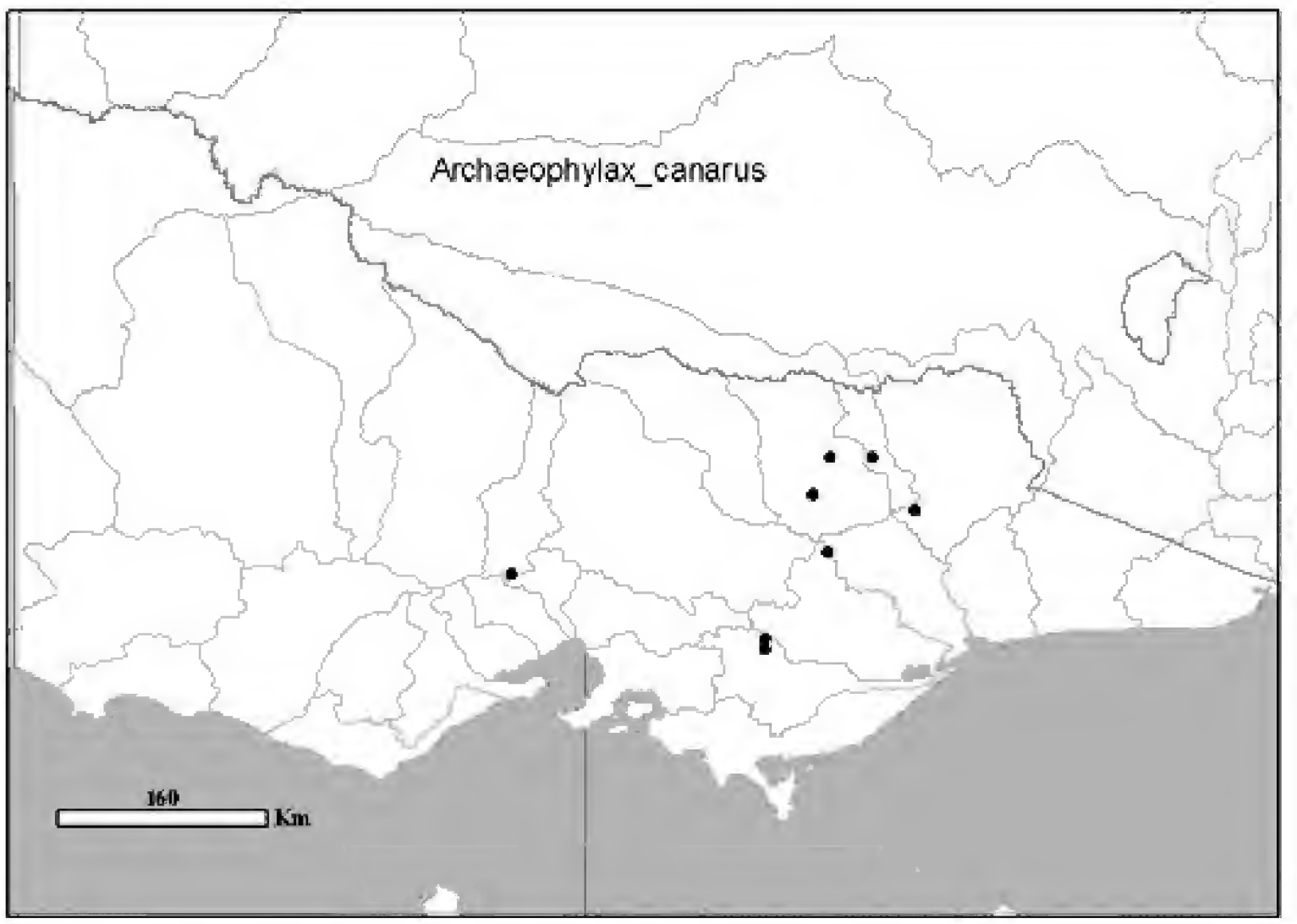
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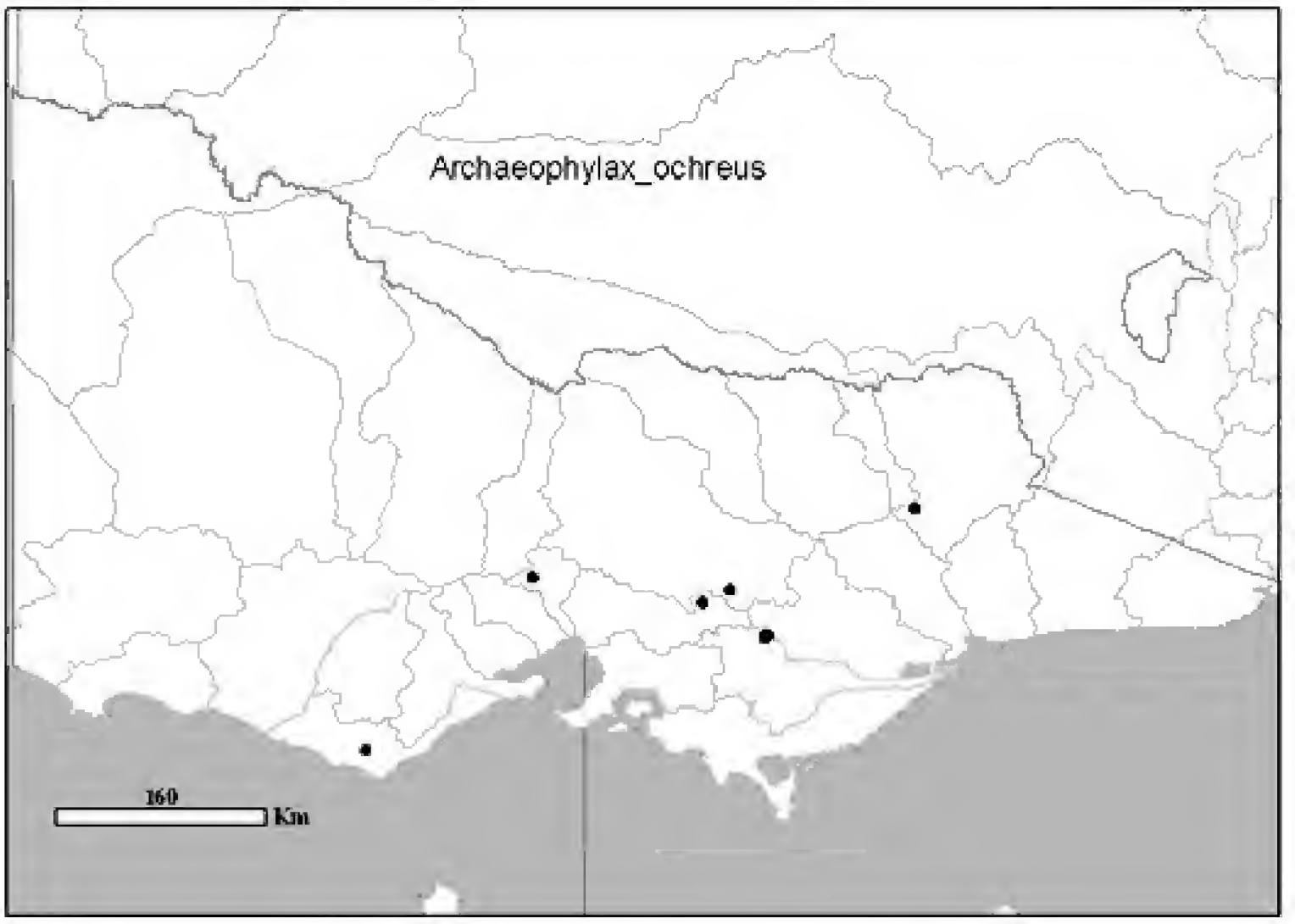
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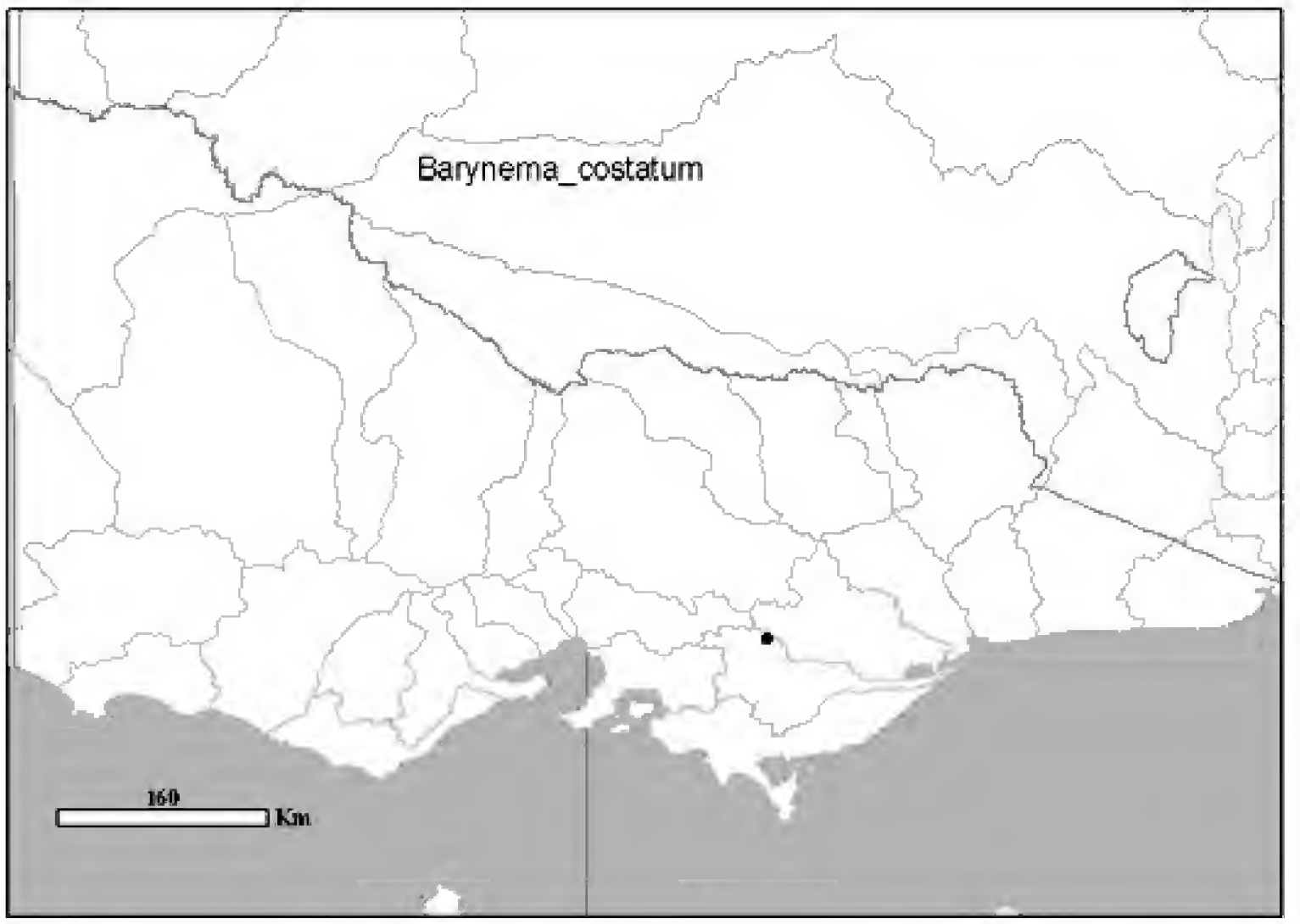
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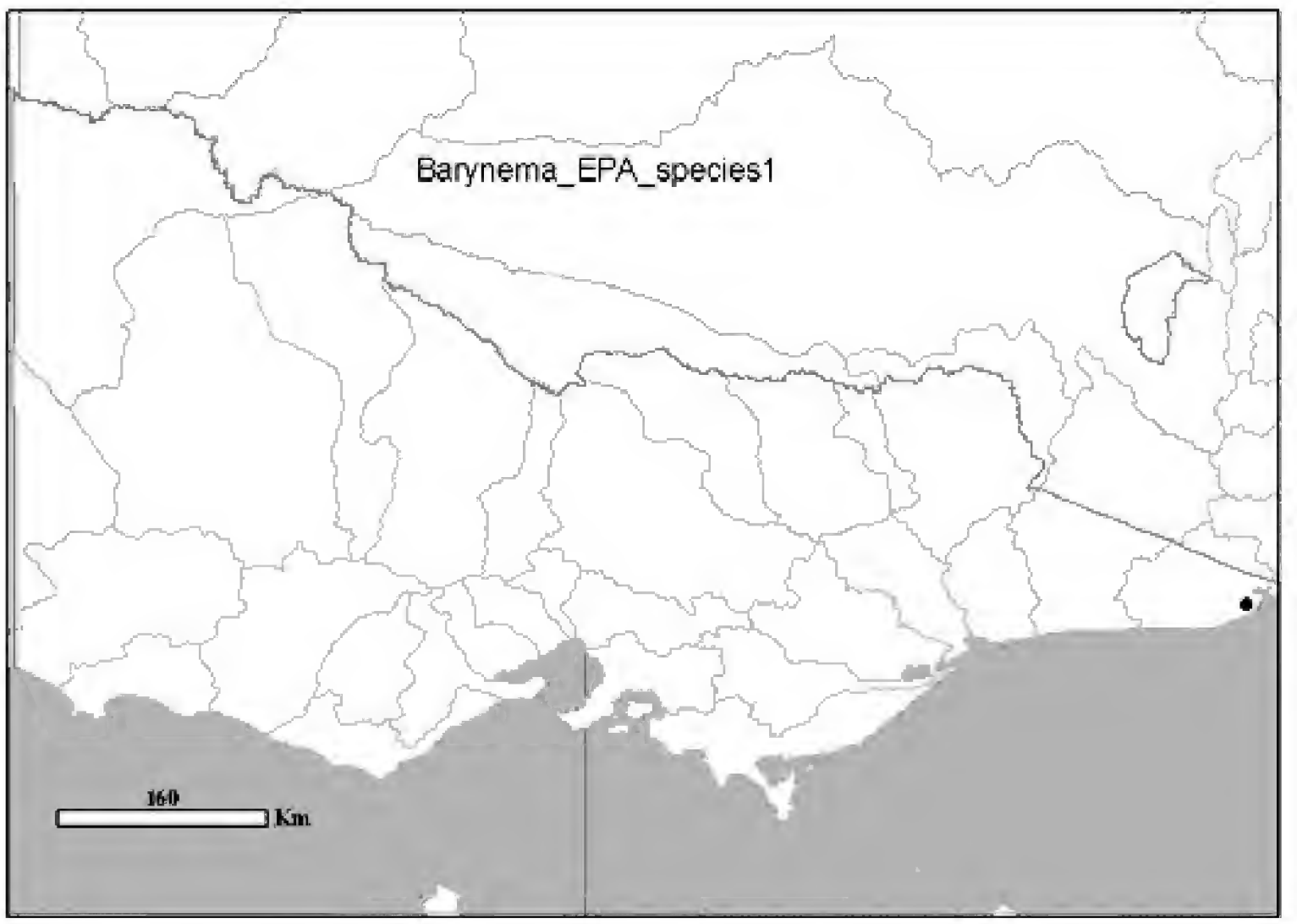
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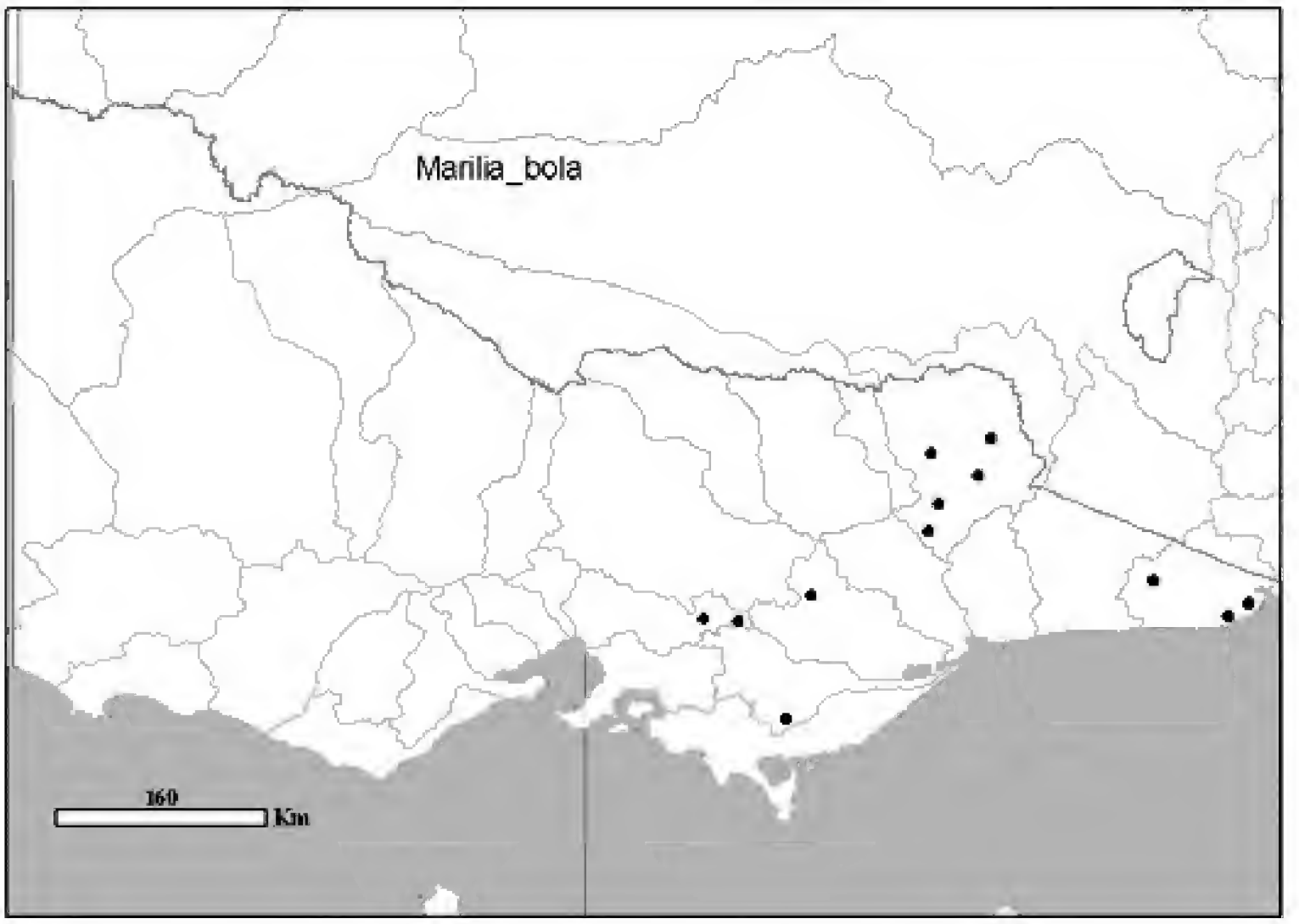
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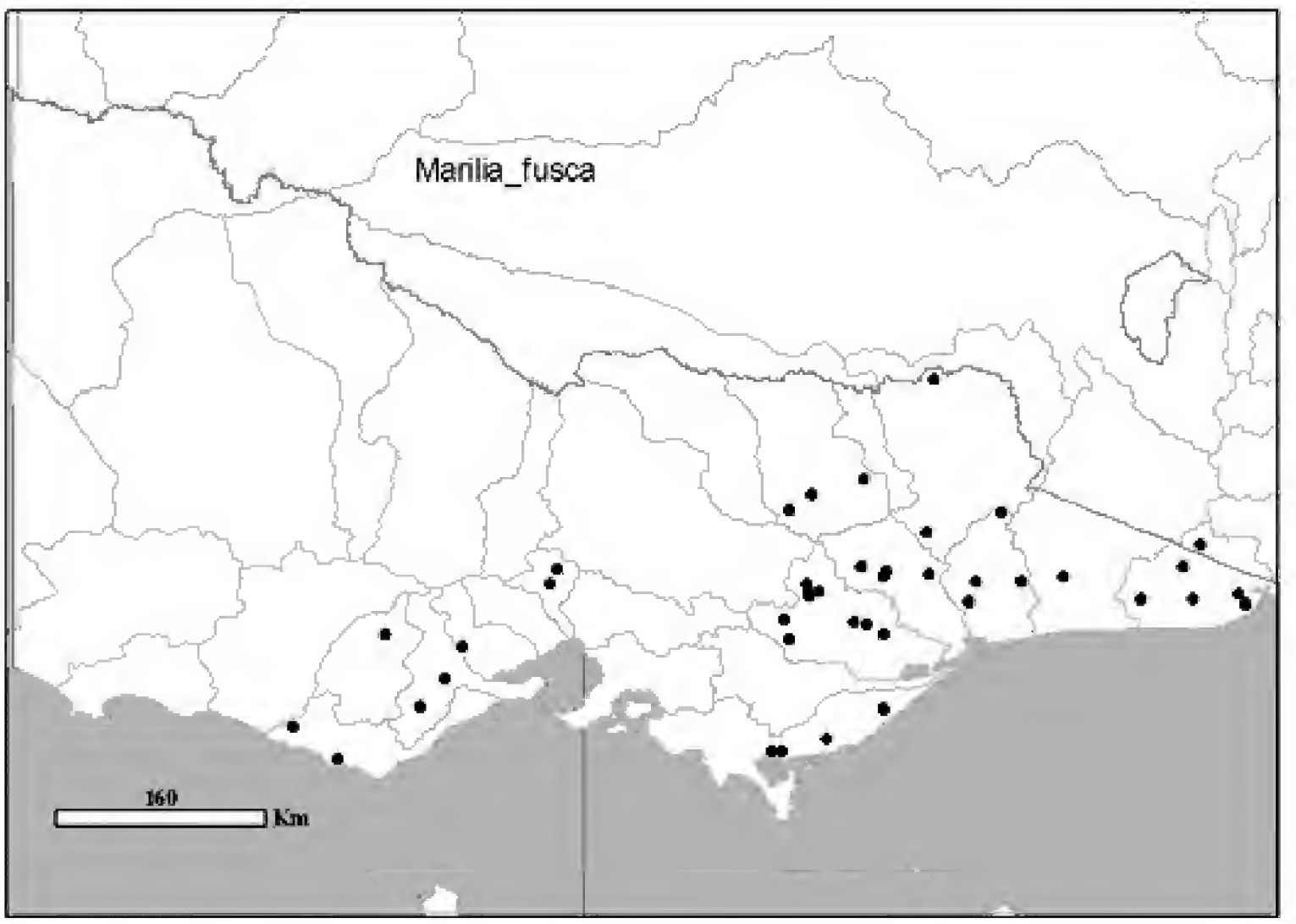
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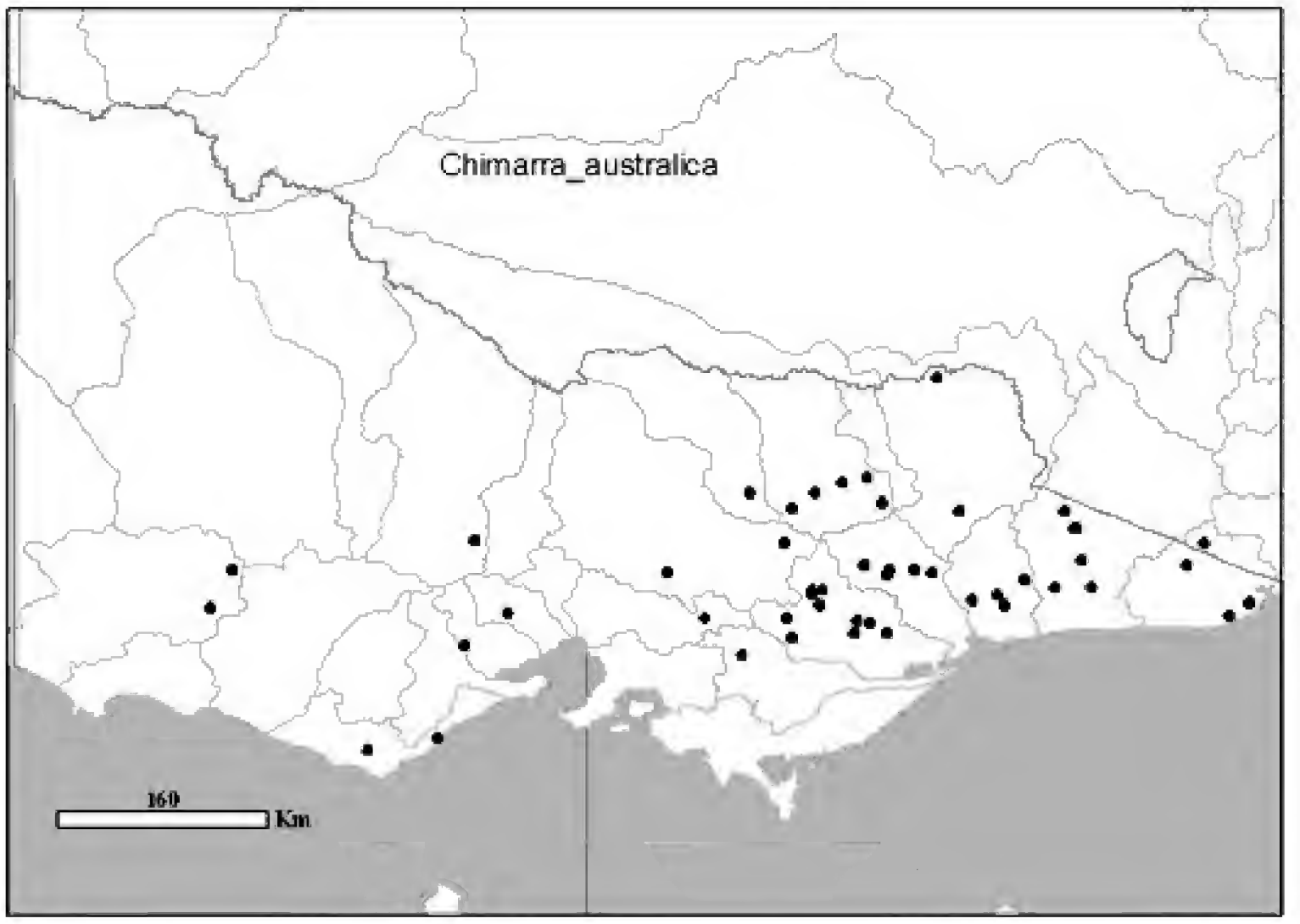
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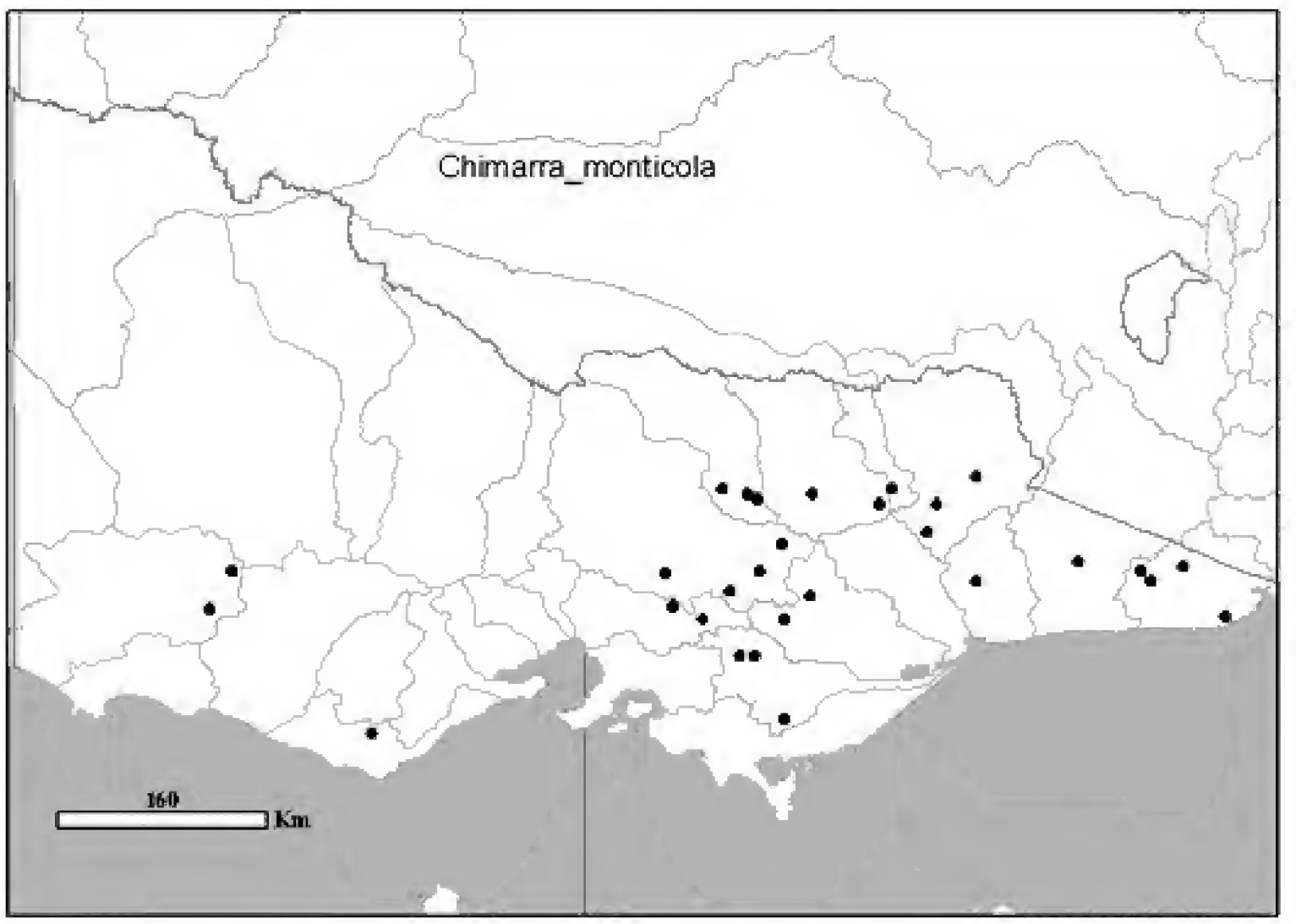
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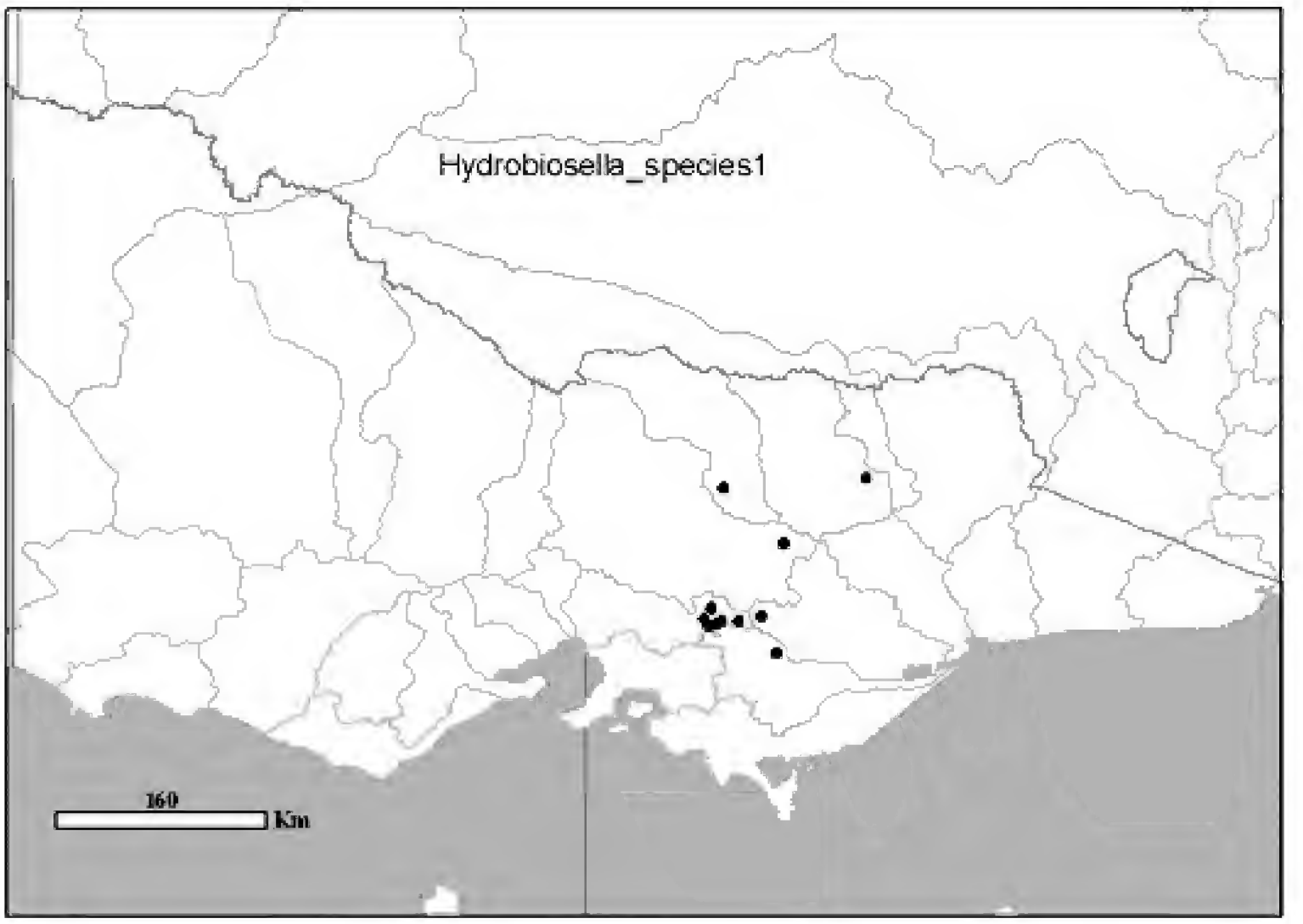
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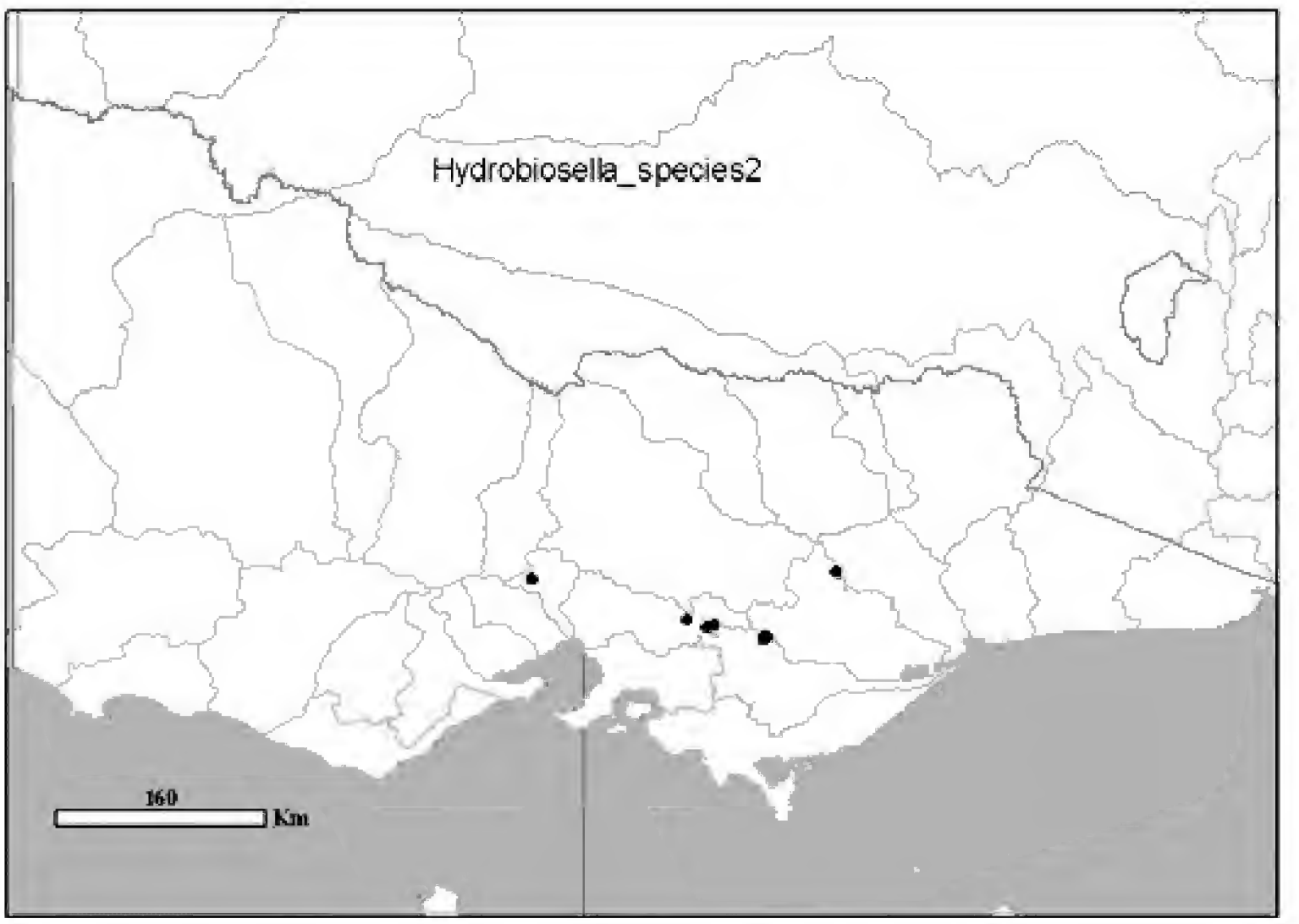
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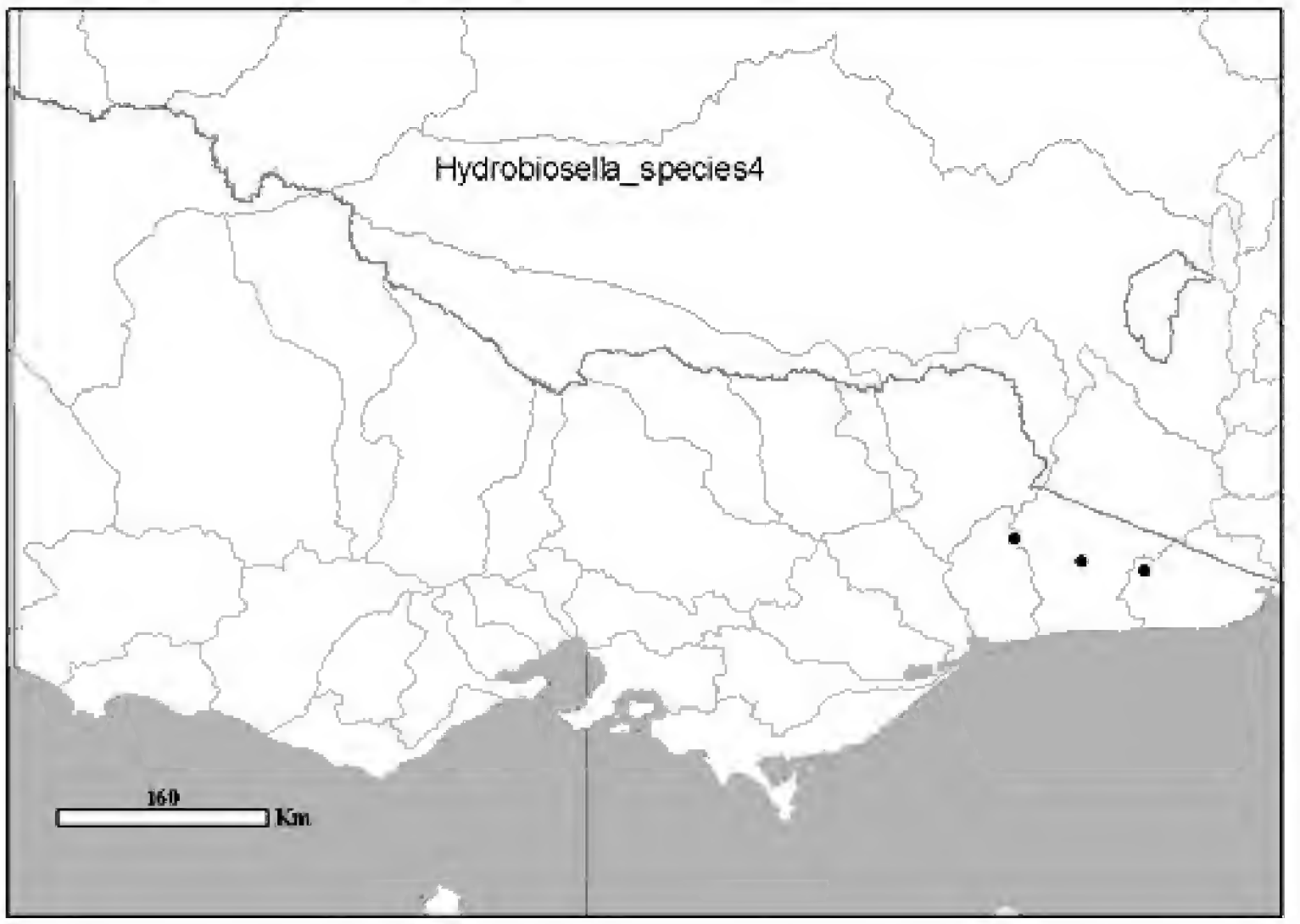
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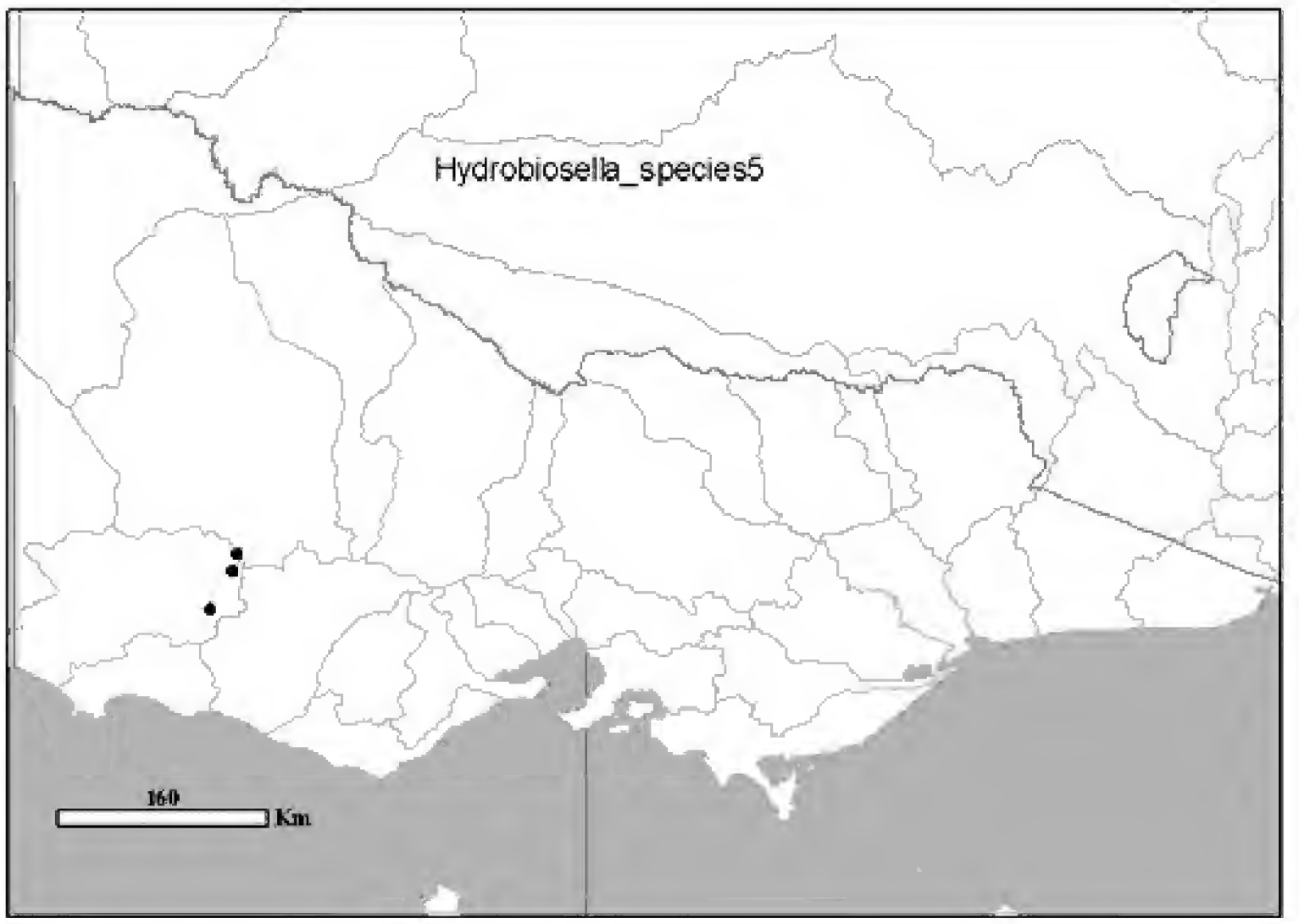
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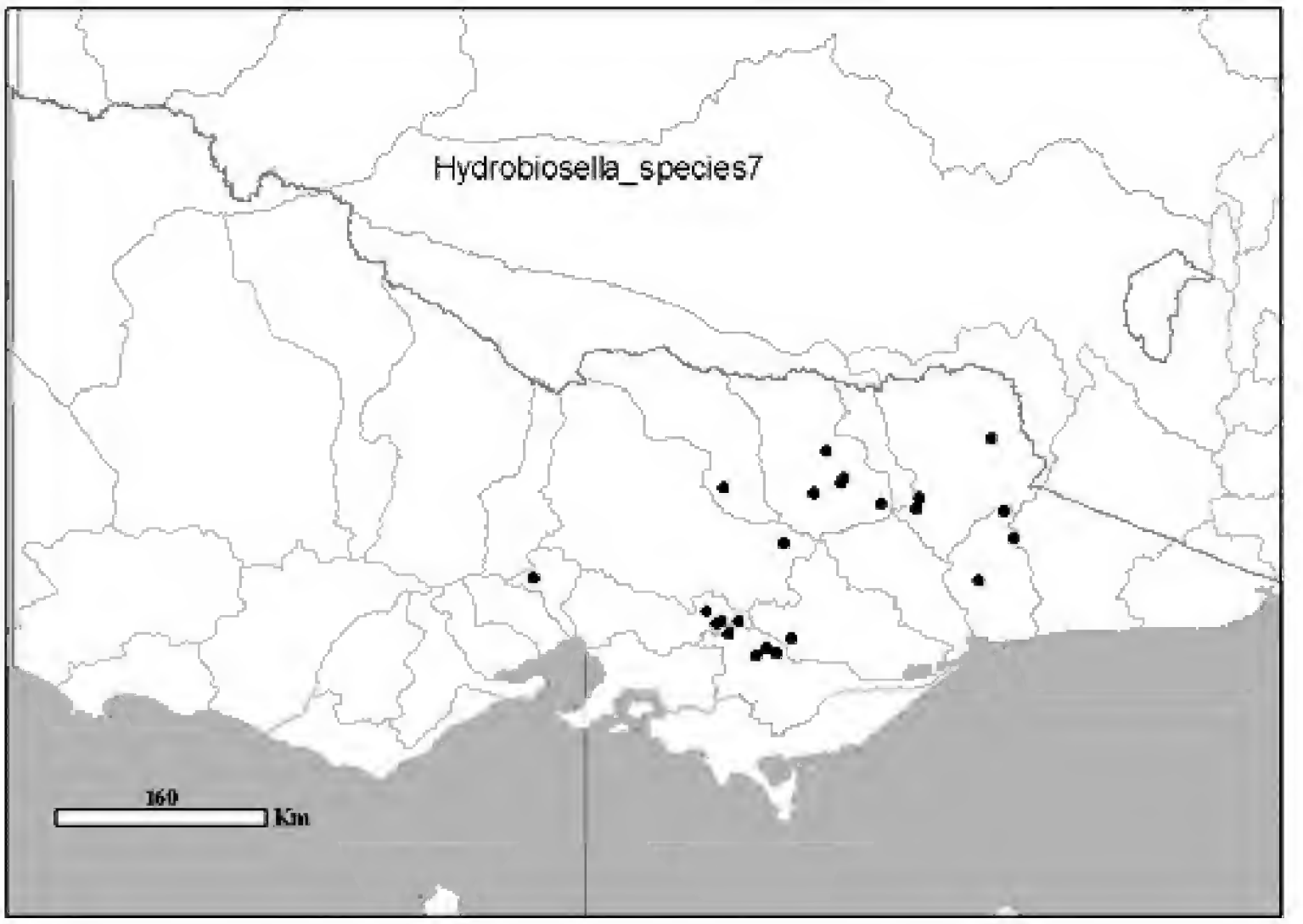
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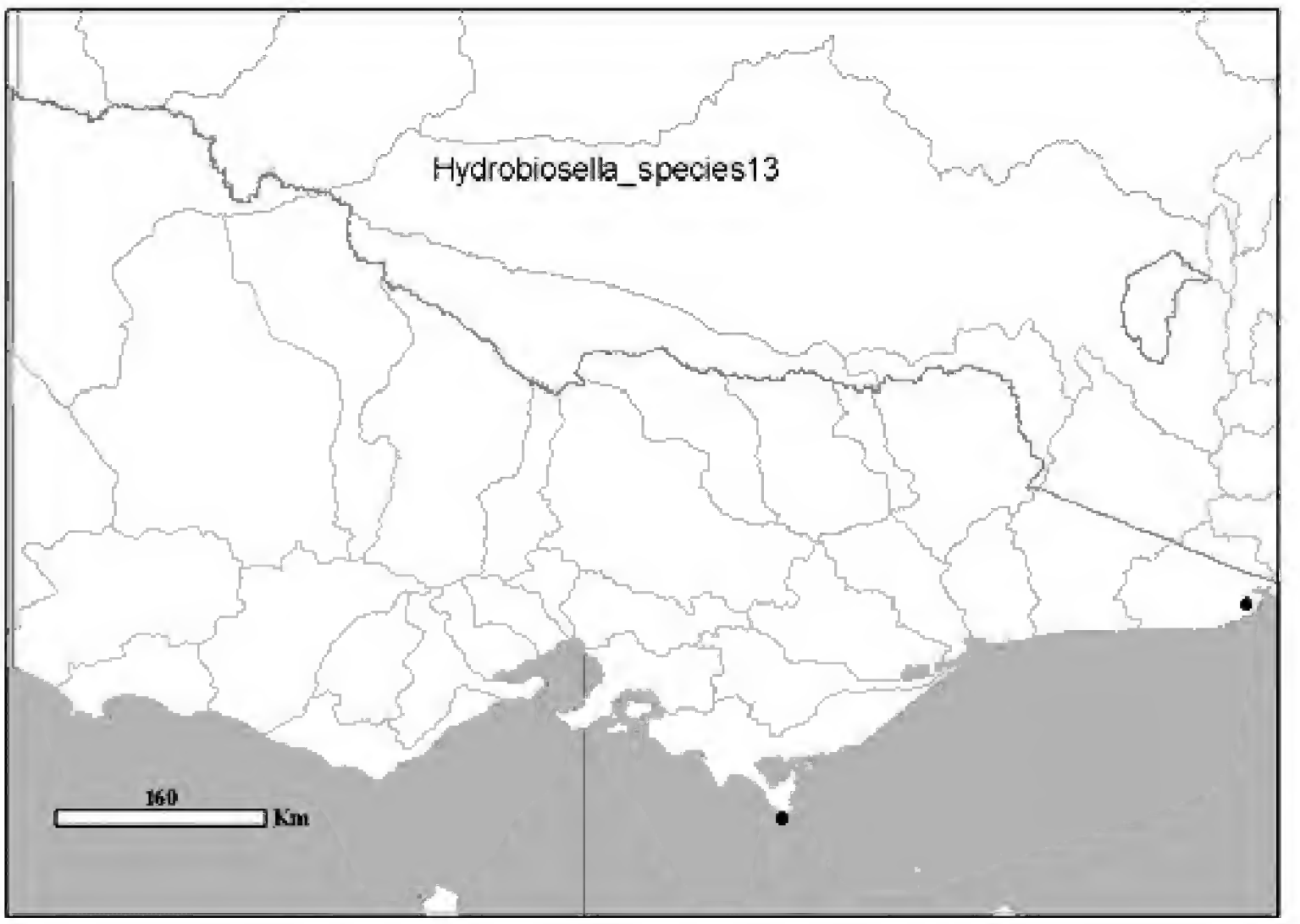
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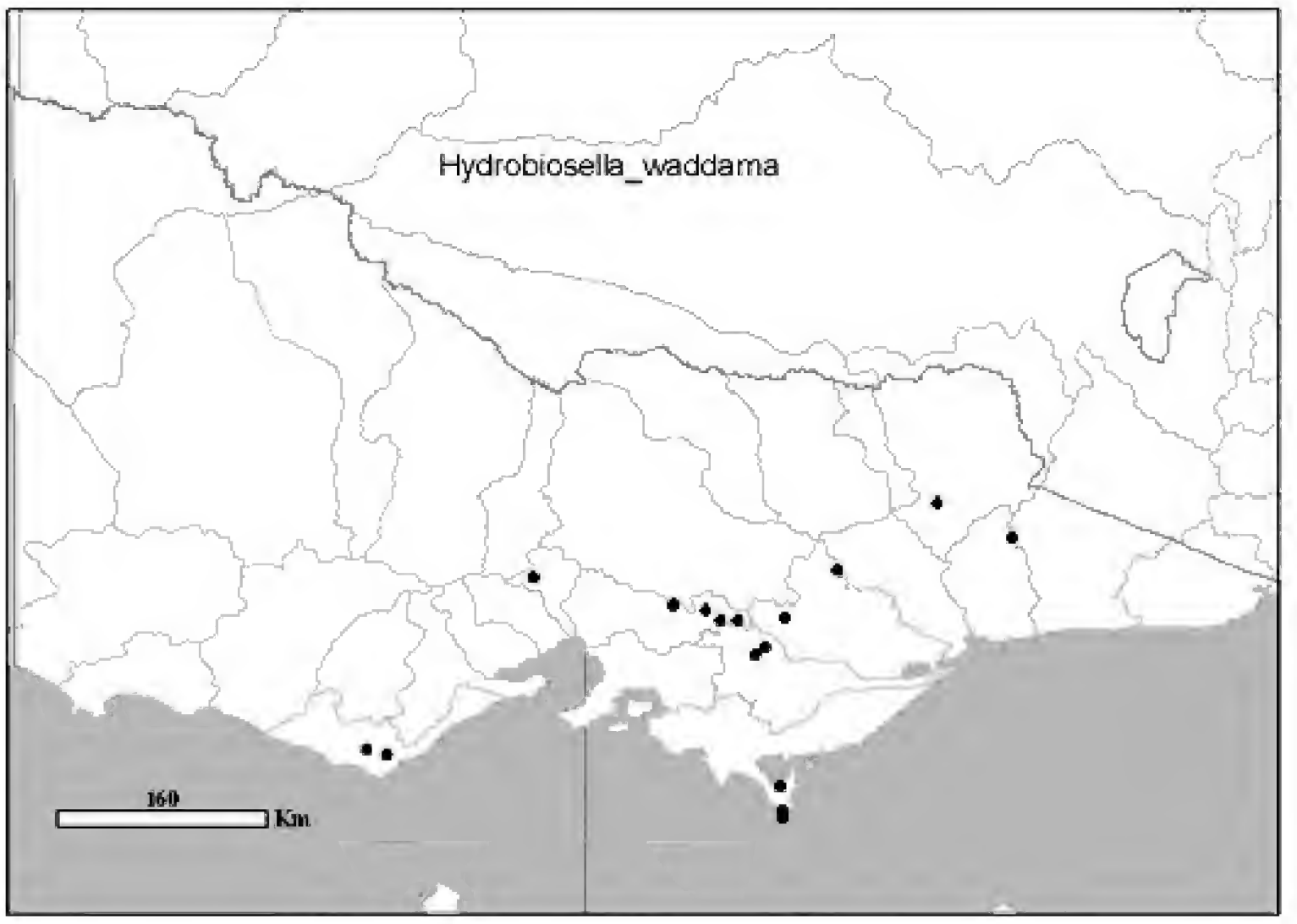
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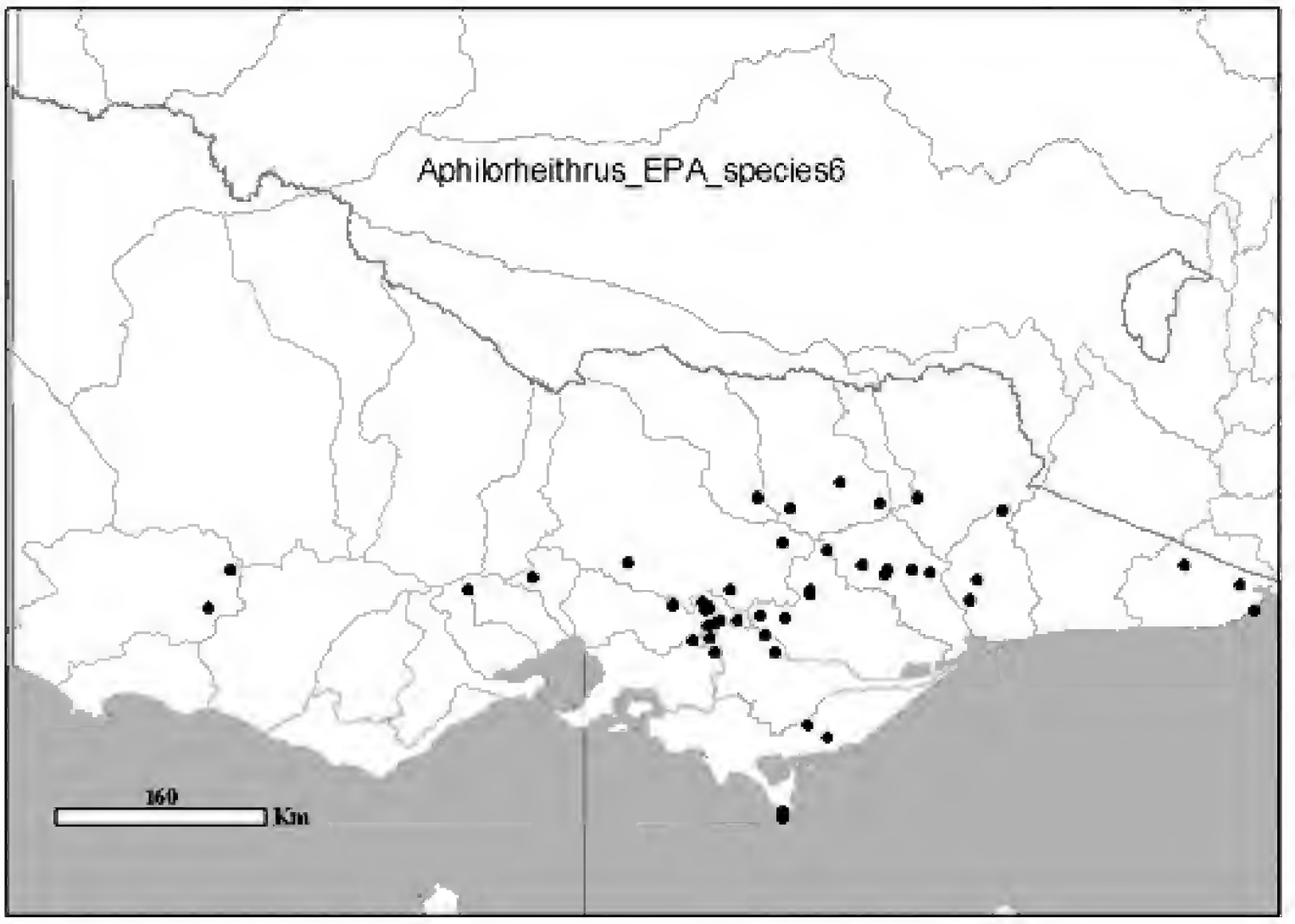
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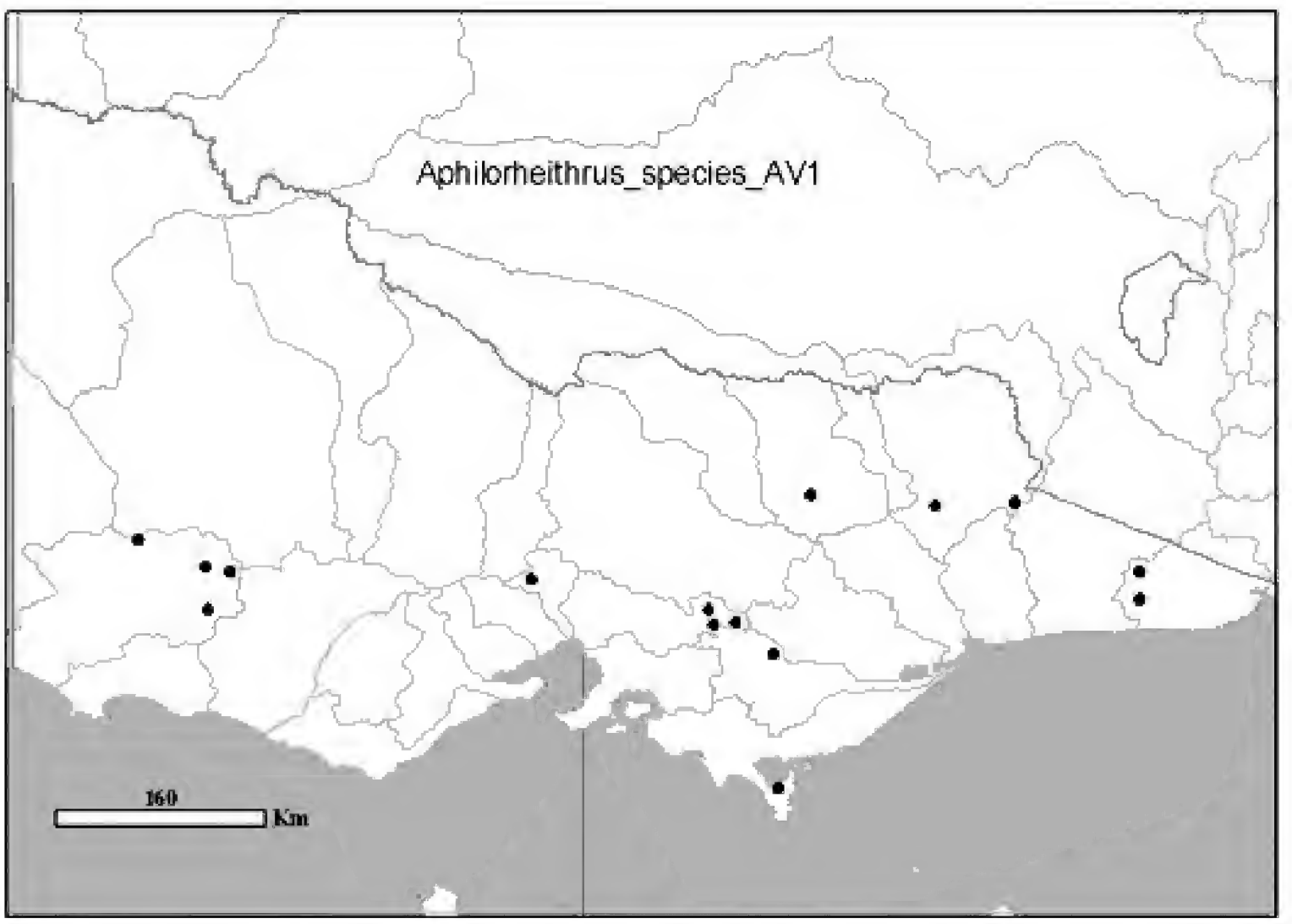
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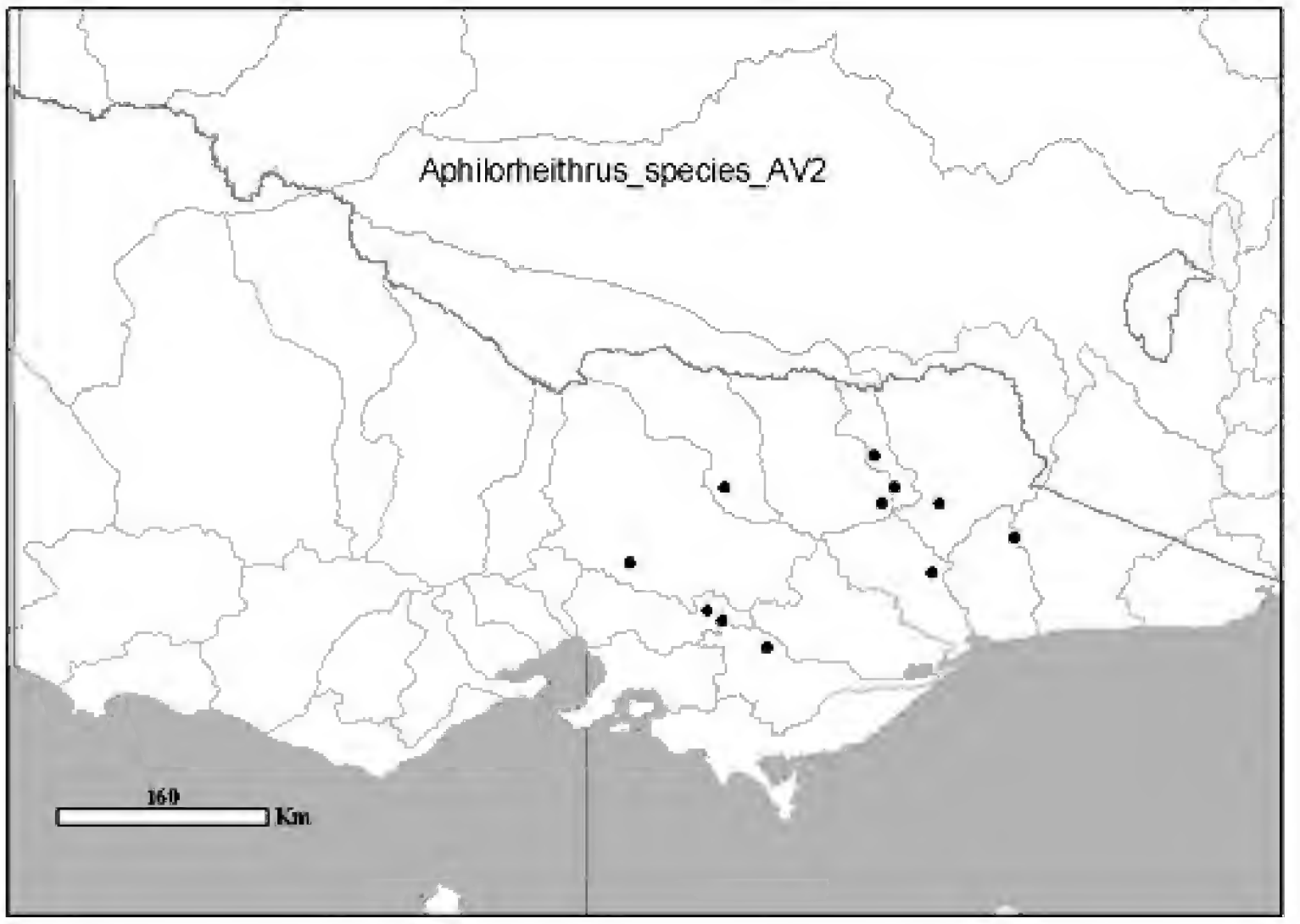
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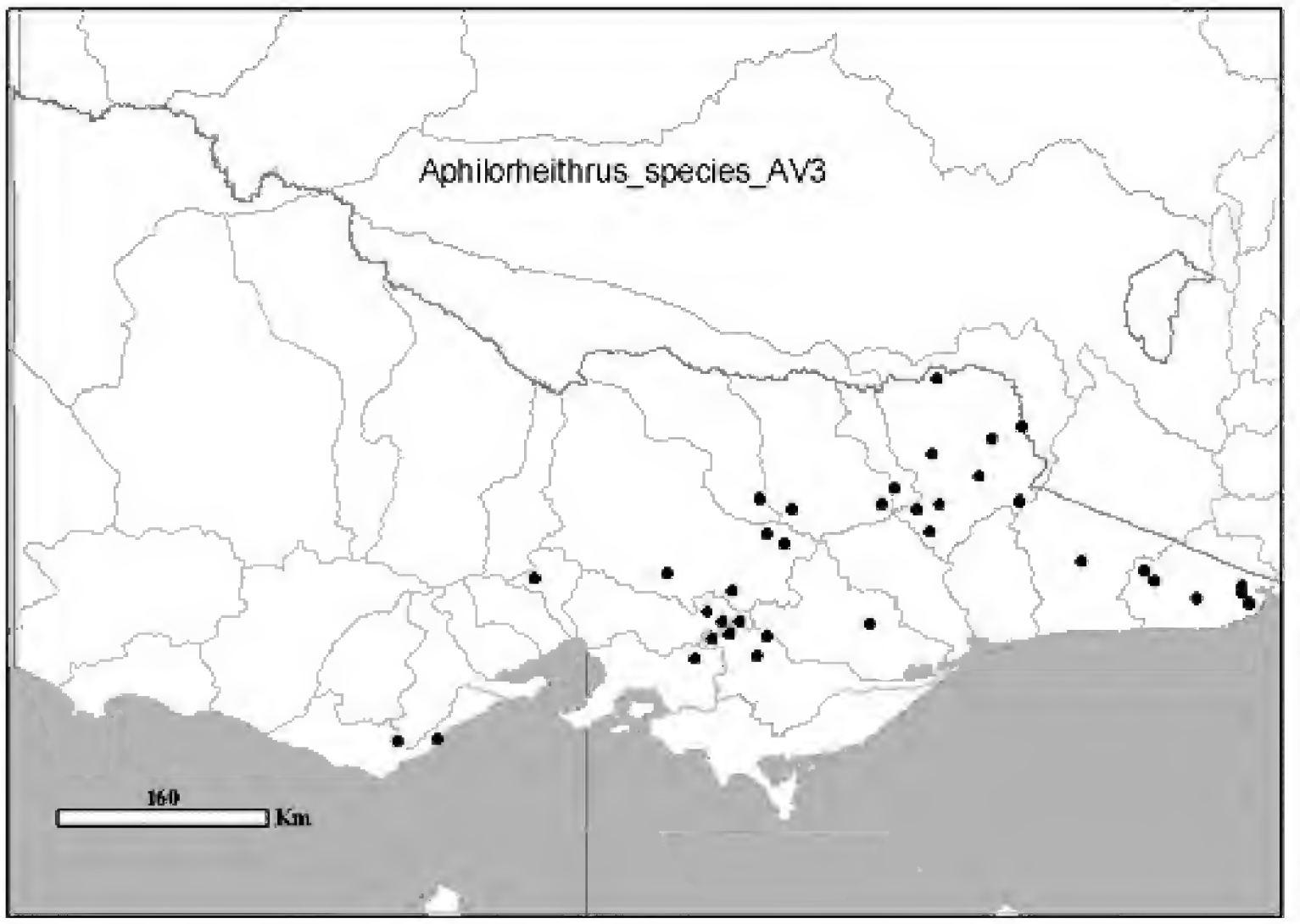
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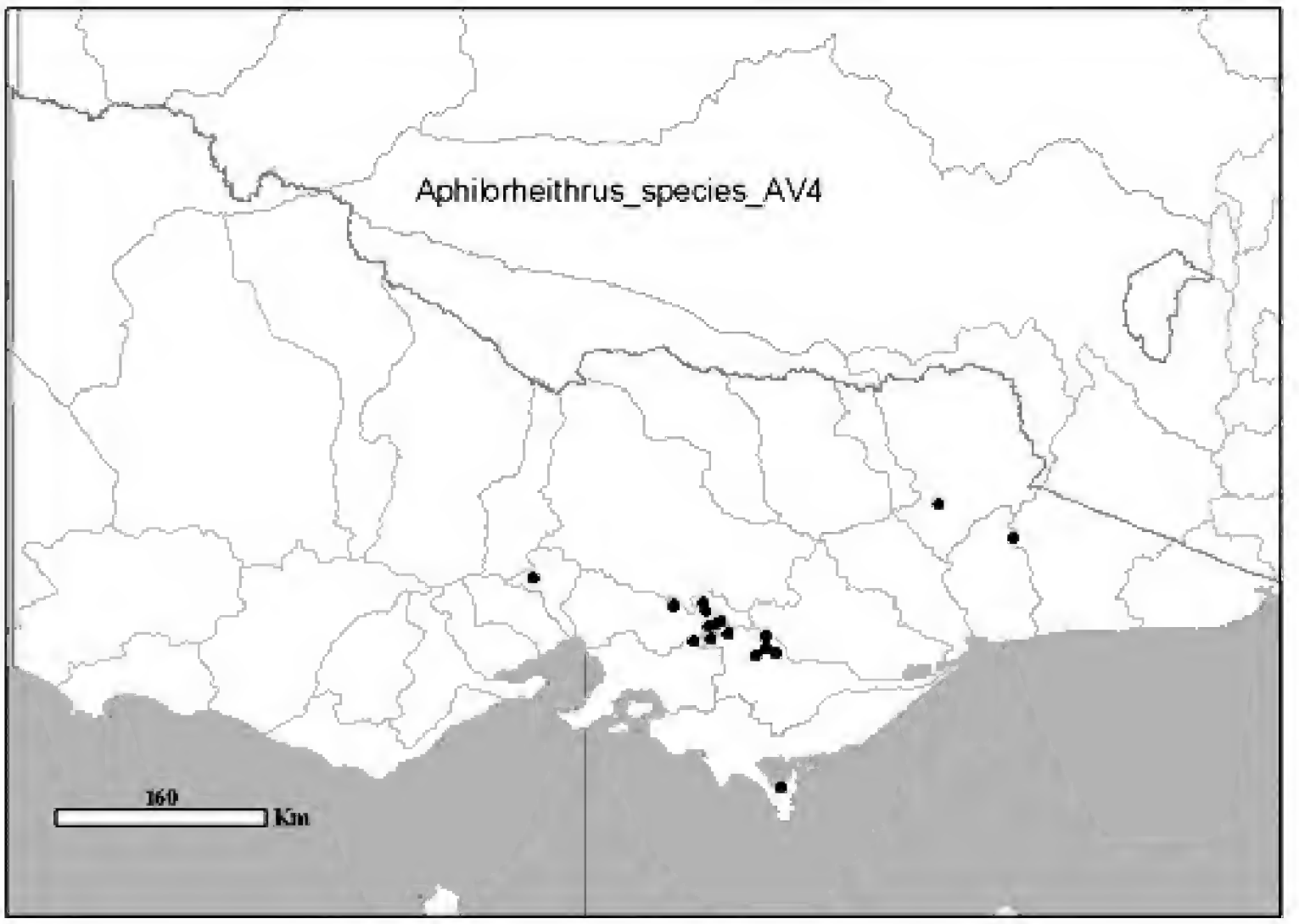
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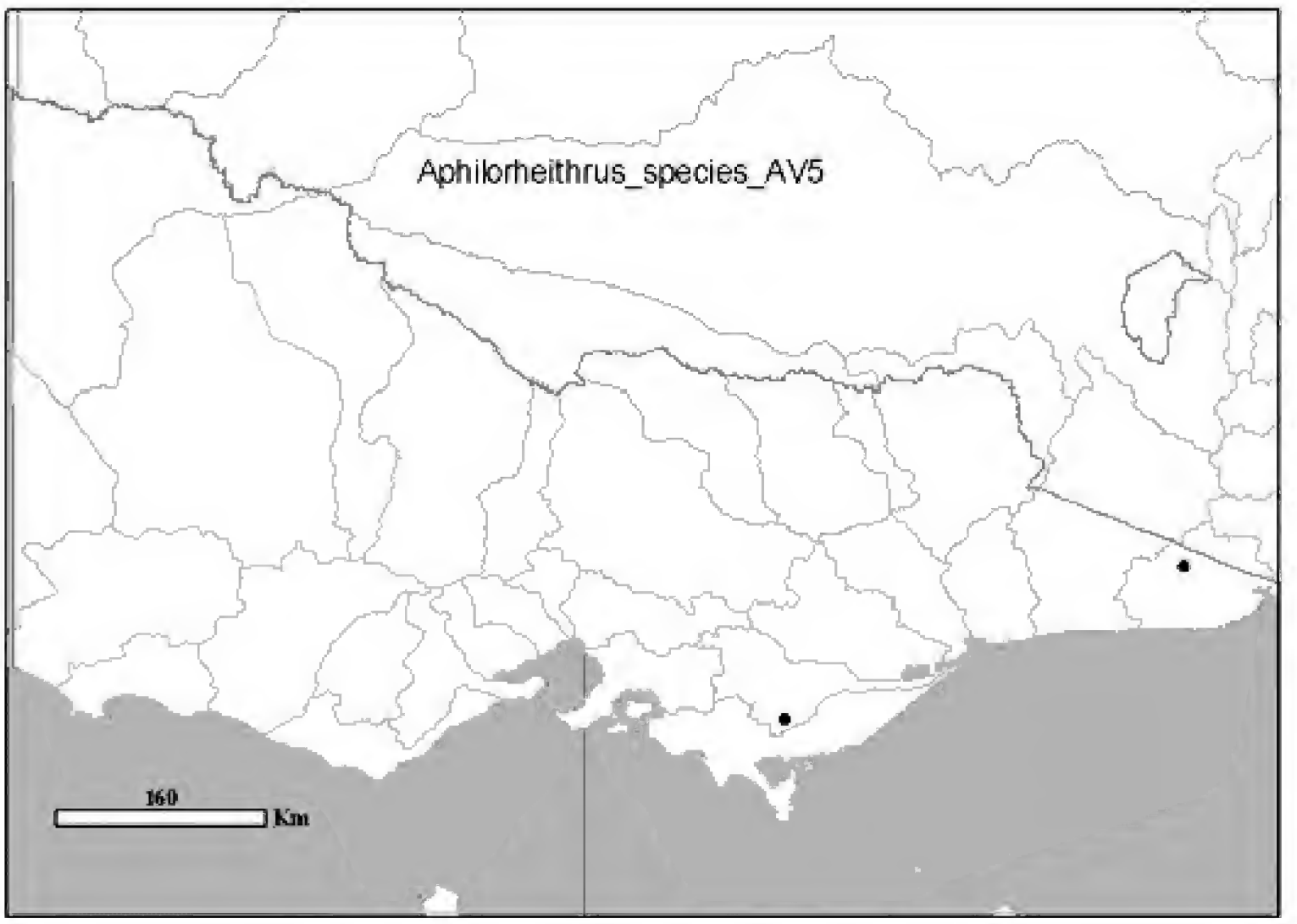
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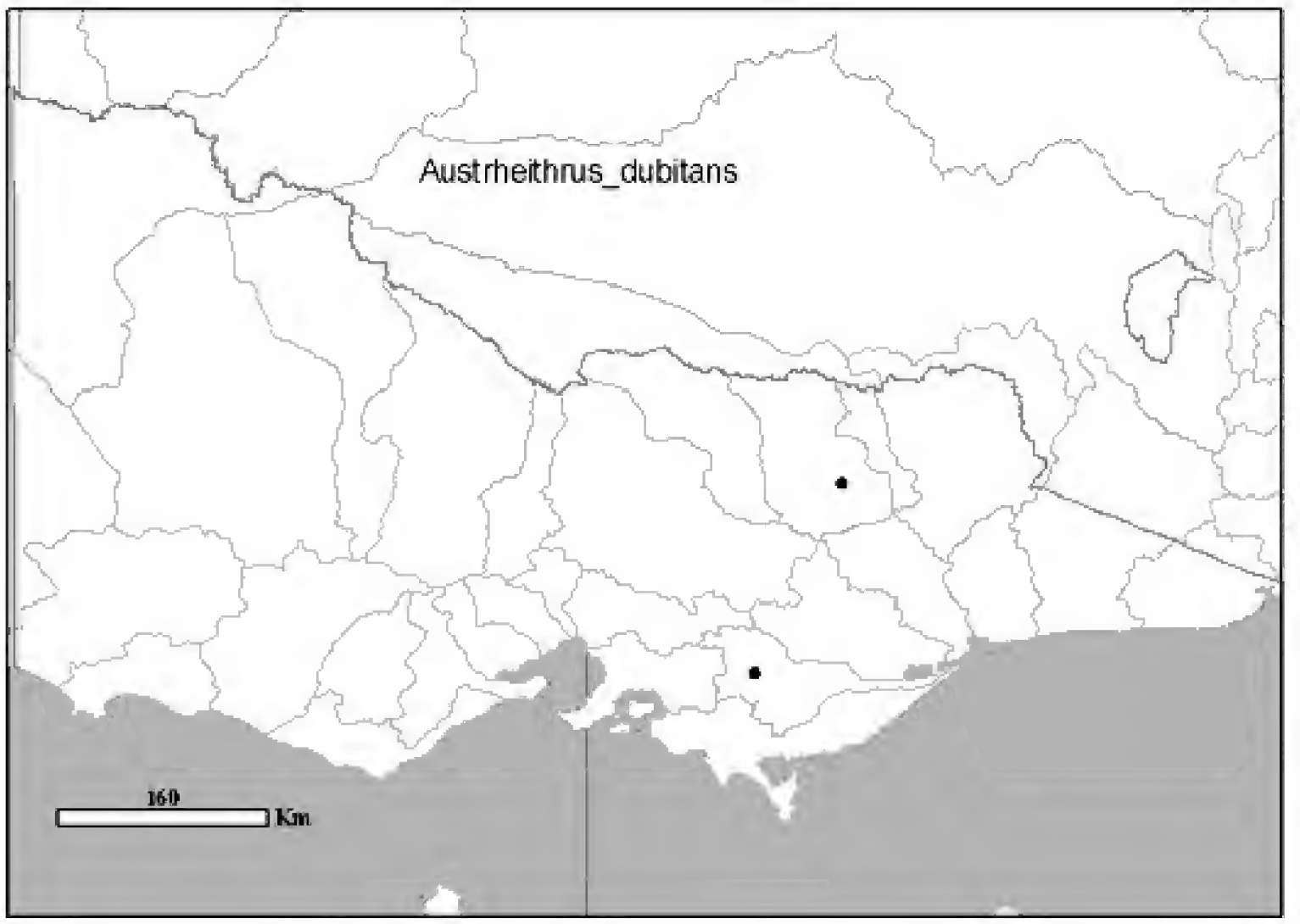
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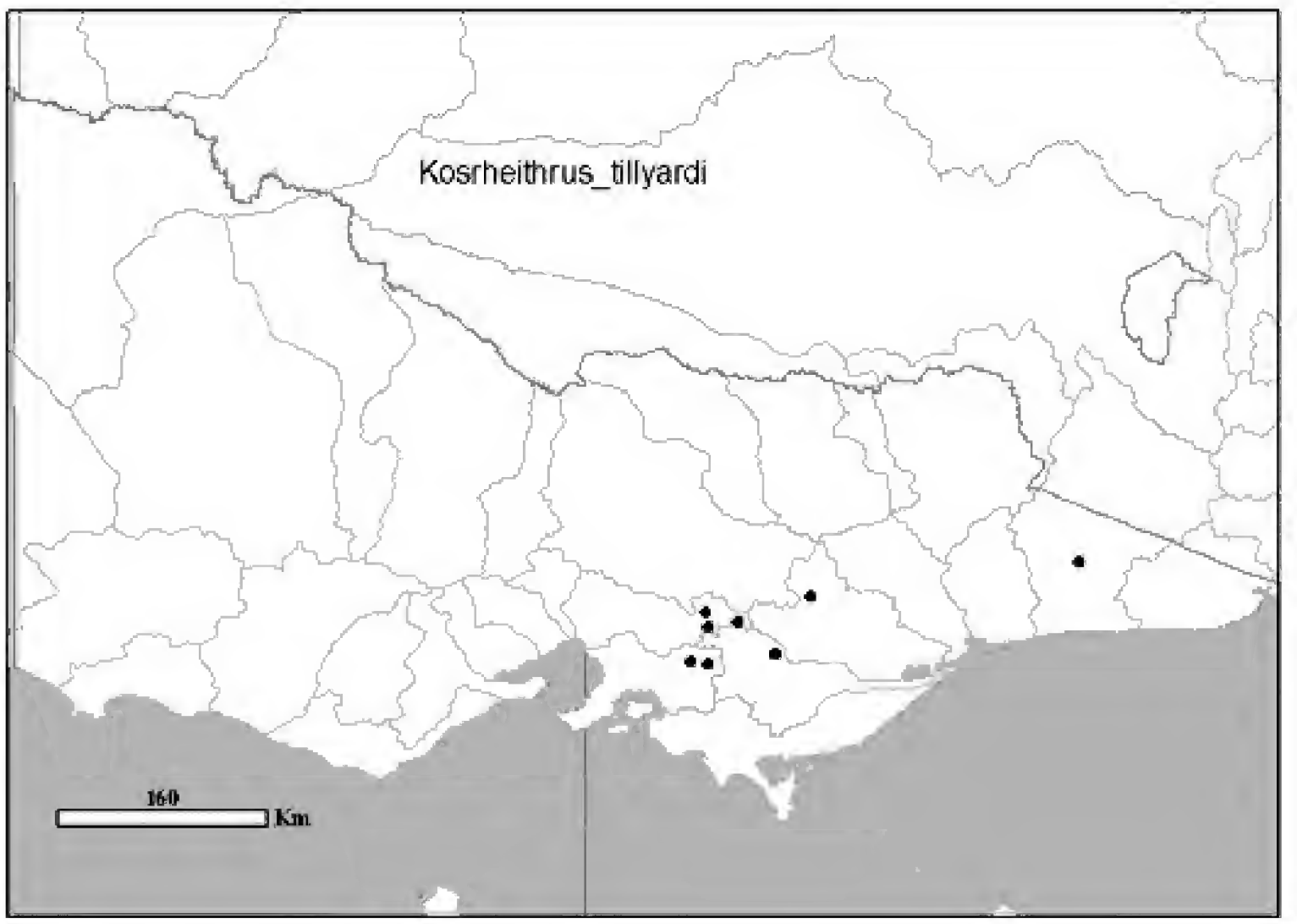
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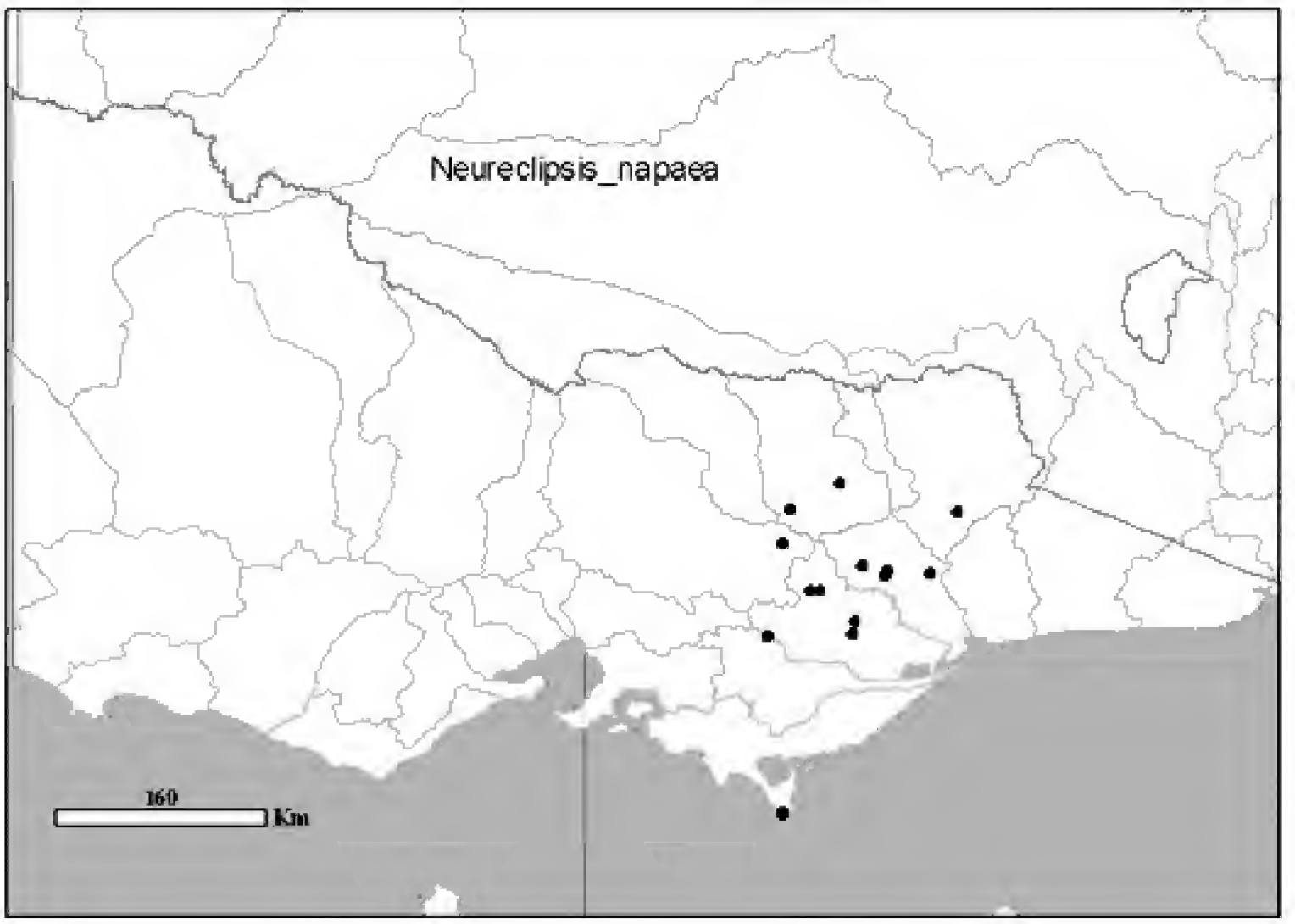
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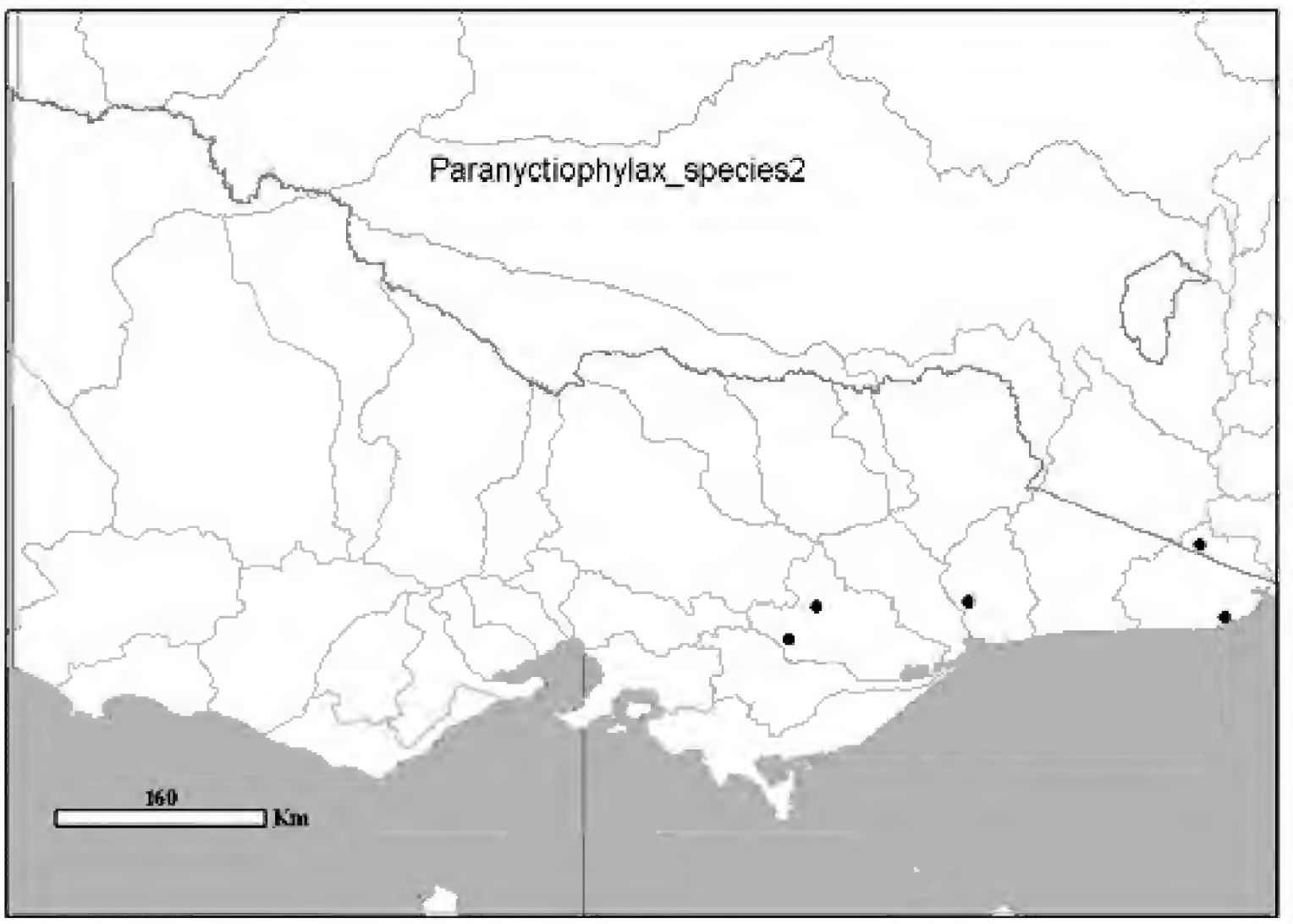
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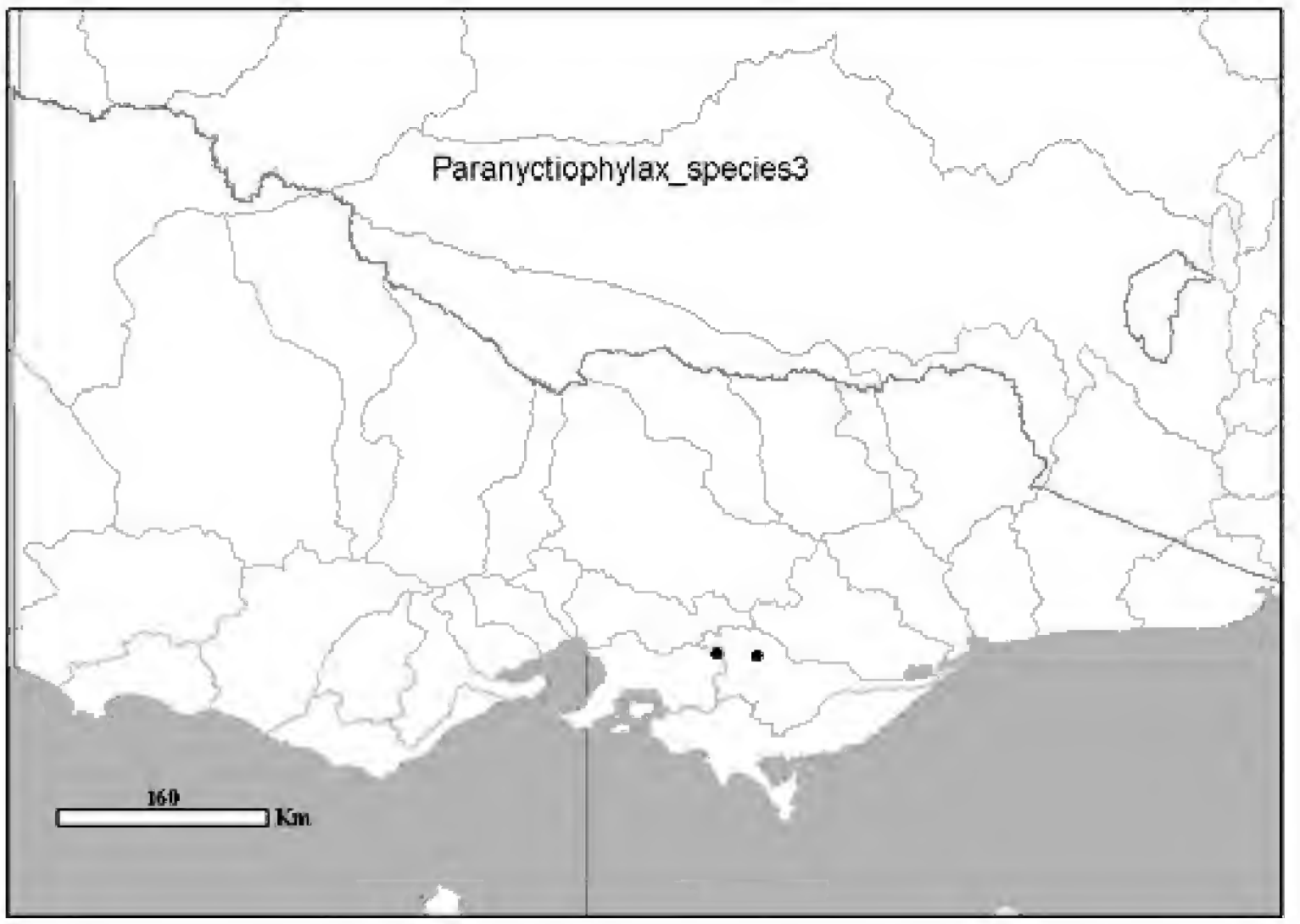
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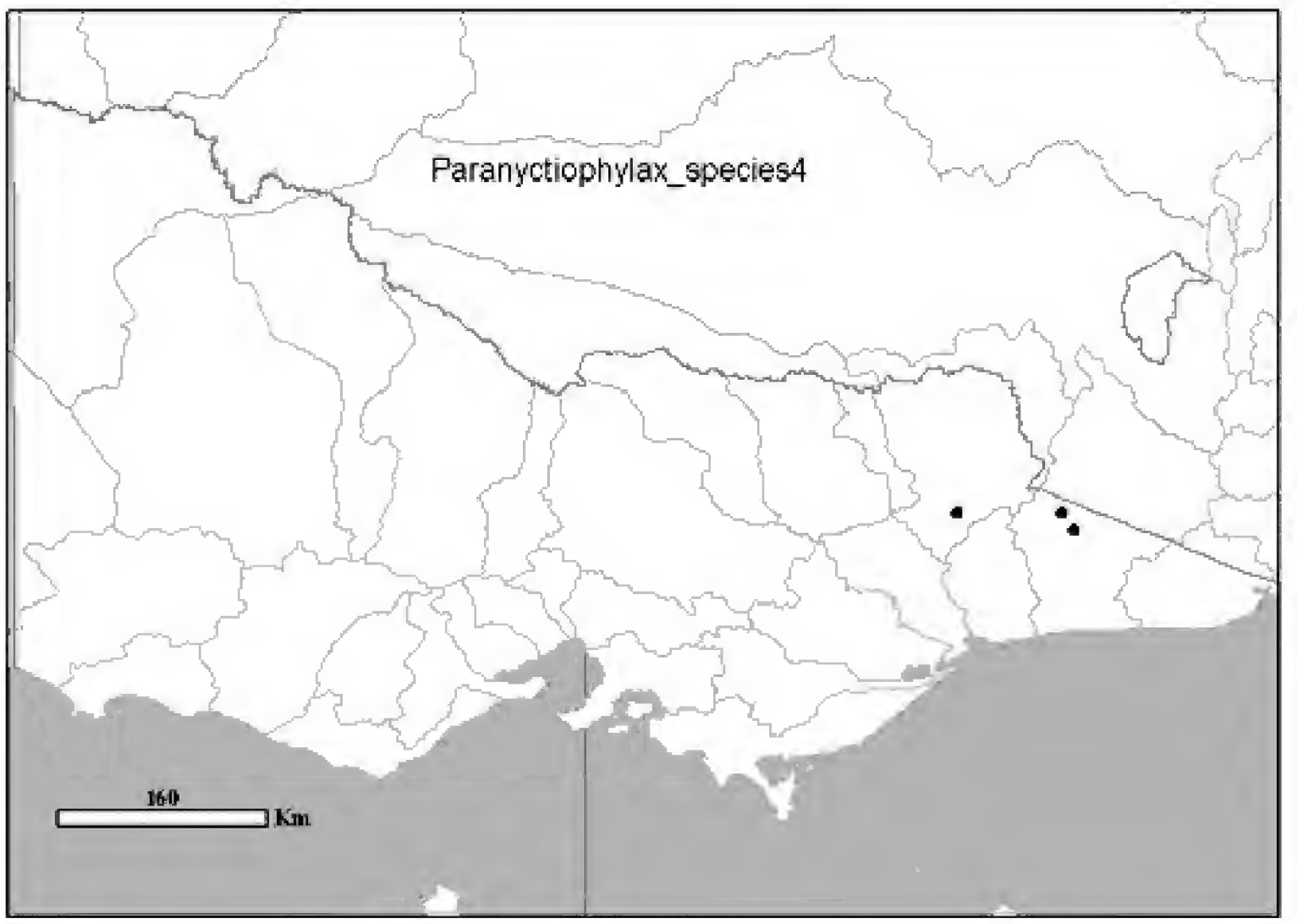
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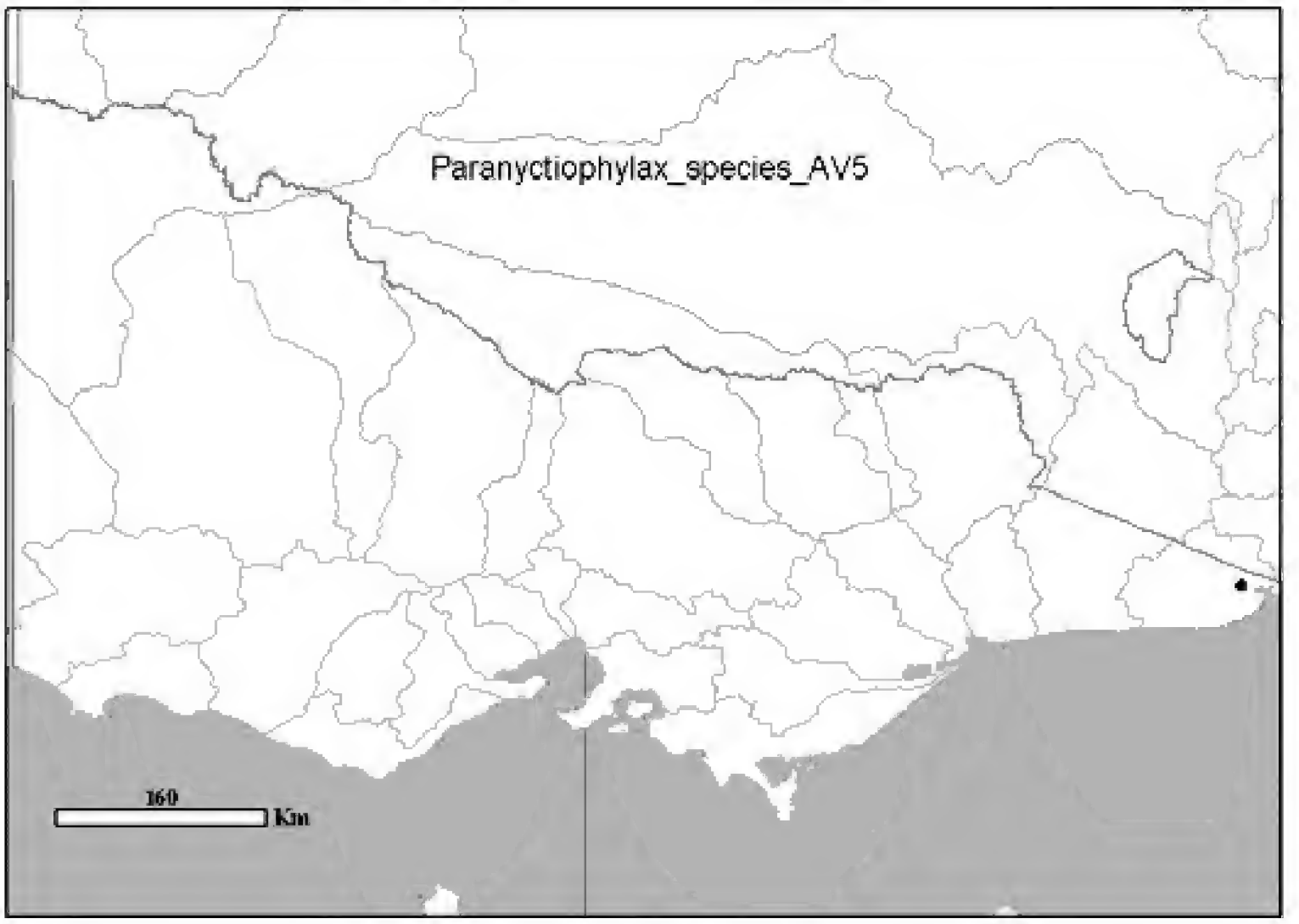
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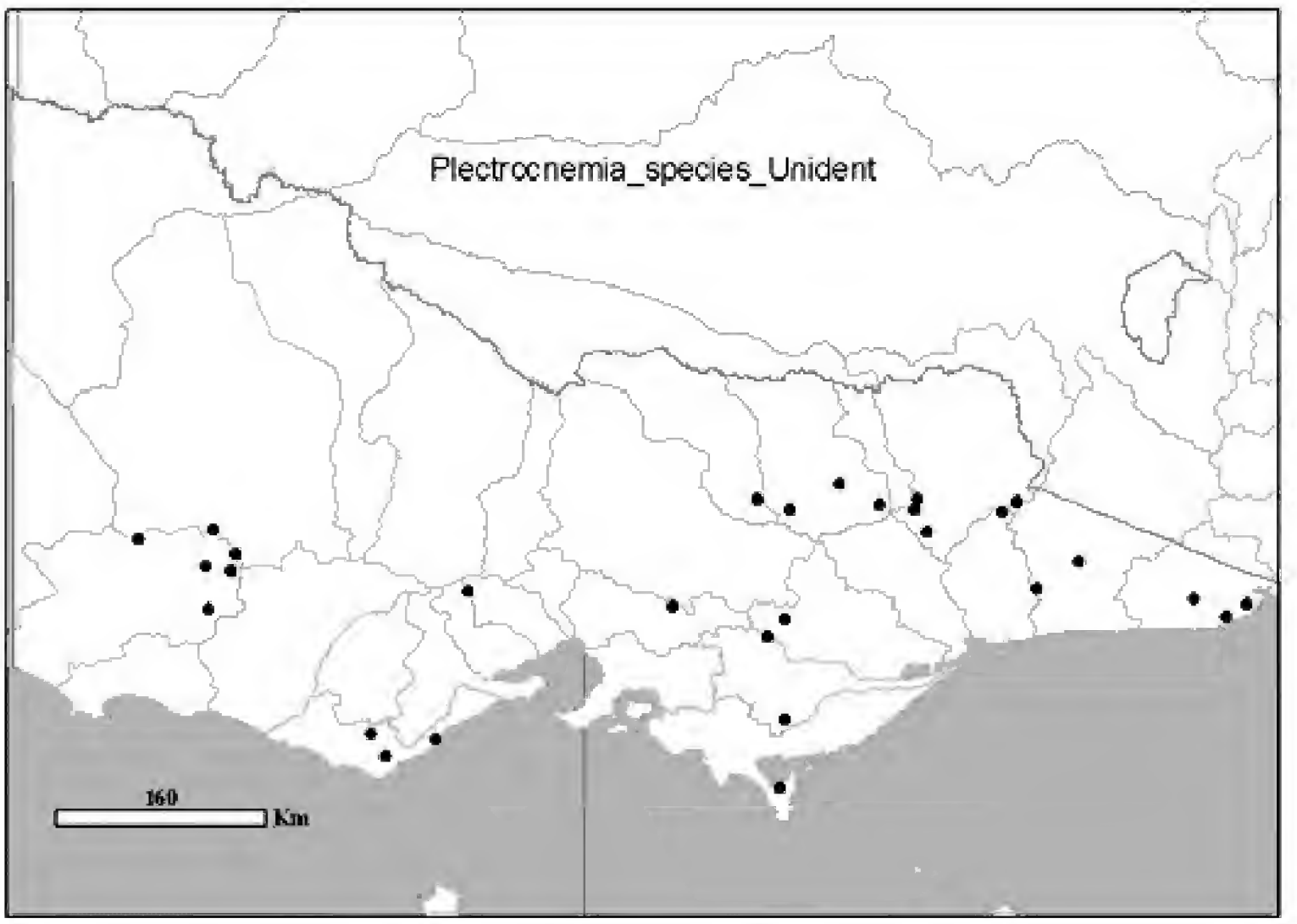
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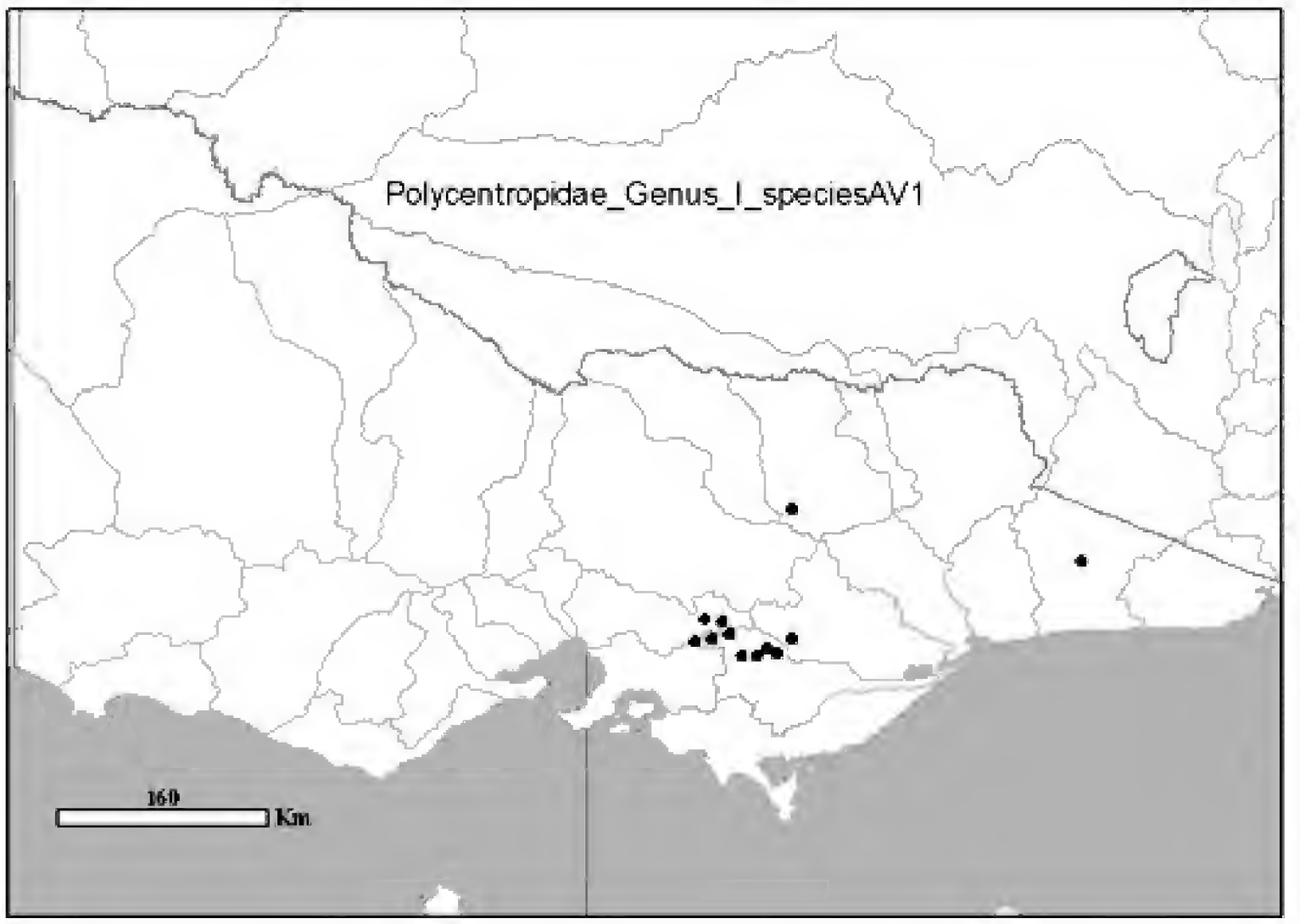
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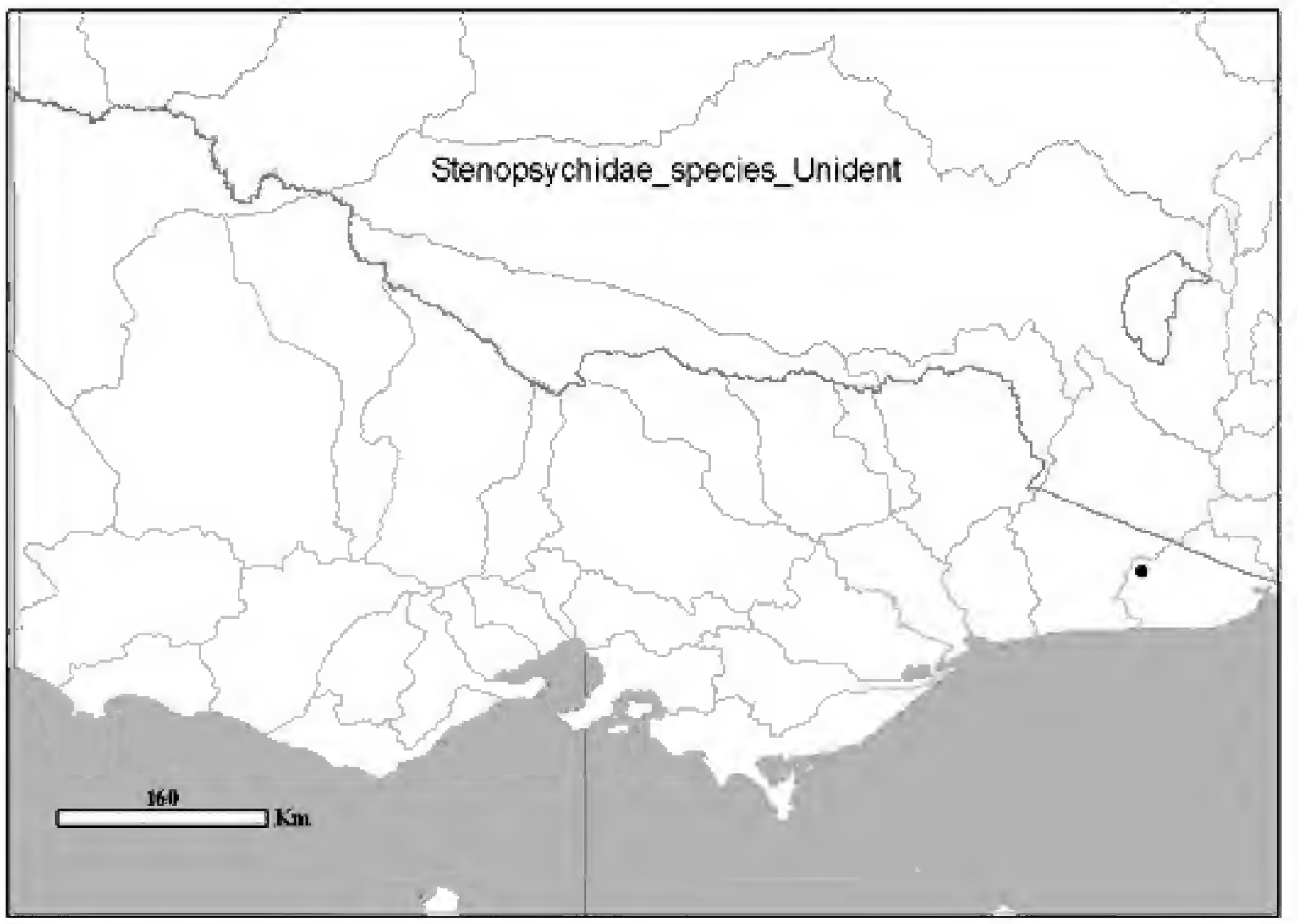
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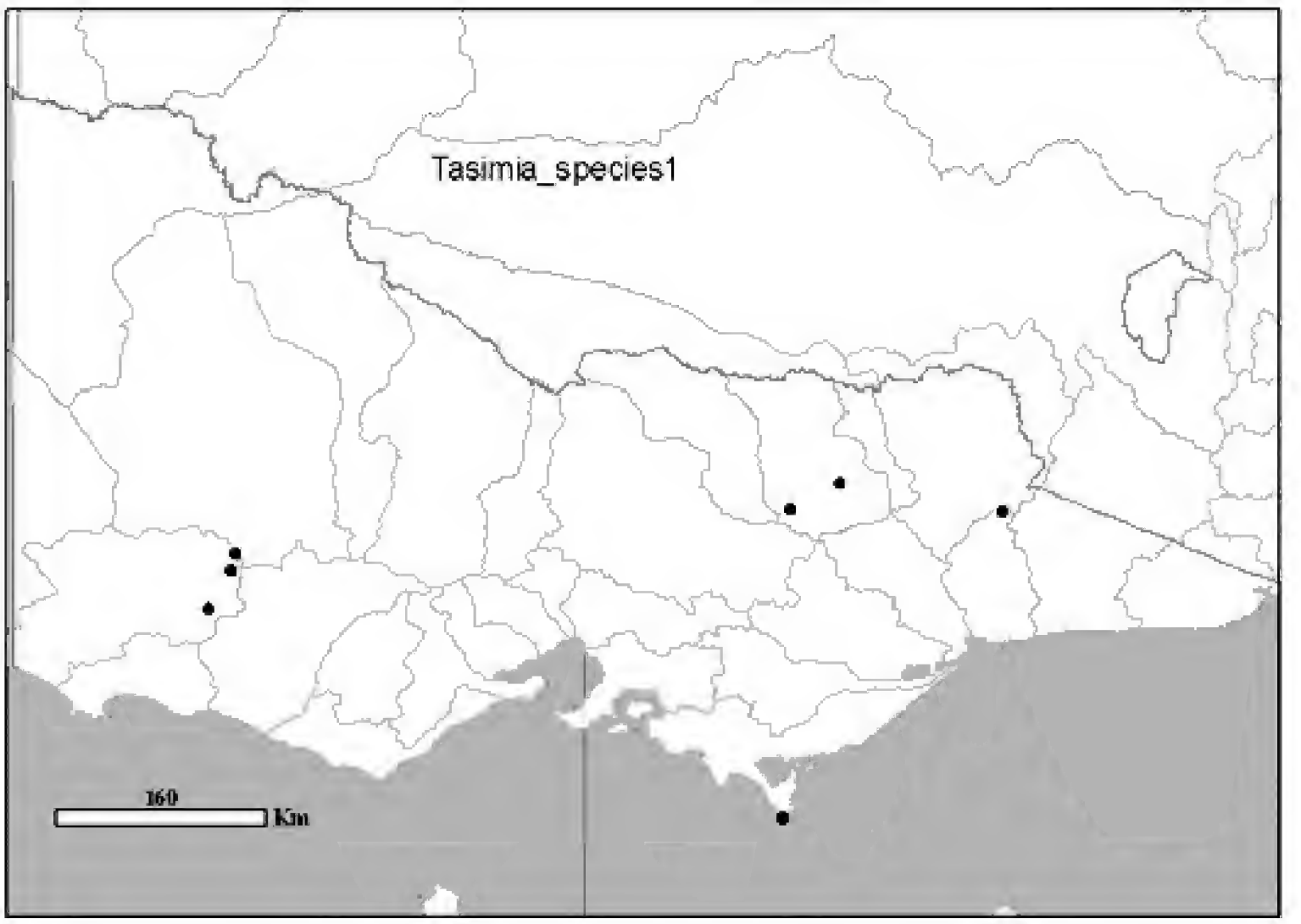
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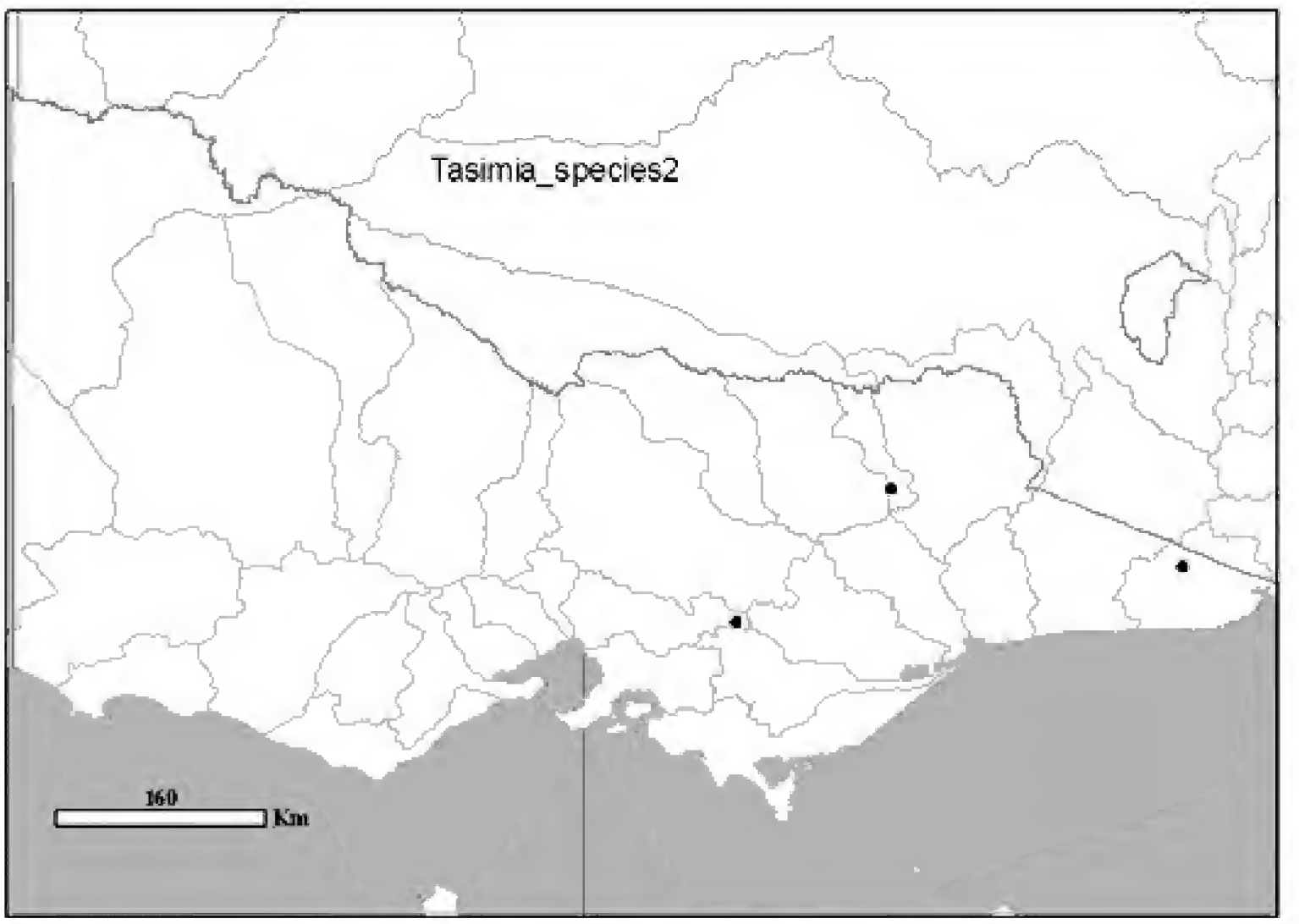
Tasimia_species2
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