

Inventory of Australian Megaloptera larvae and resulting implications for the classification of the group (Insecta: Neuropterida)

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Abstract

A b s t r a c t : The information available on the larvae of the Australian Megaloptera is presented and used for re-appraisal of some supraspecific taxa. *Apochauliodes* THEISCHINGER, formerly described as a subgenus of *Archichauliodes* WEELE is accorded full generic status. A new subgenus, *Riekochauliodes*, is established for the majority of the Australian species of

Archichauliodes. Only three of four species groups of *Archichauliodes* (*Riekochauliodes*) separable on the basis of adult characters, are distinguished on larval morphology. A key to the larvae of the now recognised group taxa of the Australian Megaloptera and distributional details of most species are given in order to initiate more thorough studies.

K e y w o r d s : Megaloptera, Australia, larvae, classification.

Introduction

Some information on the taxonomy of the larvae of the Australian Megaloptera was given in the first revision of the group (RIEK 1954). Presentation of accumulated information on the larvae was announced for the future in a more comprehensive treatment of the adults (THEISCHINGER 1983). In the meantime and afterwards, keys to the larvae of families and genera of Australian Megaloptera larvae were given (e.g. RIEK 1970, WILLIAMS 1980, THEISCHINGER 1991).

In this paper the now available taxonomic information on the larvae of the Australian Megaloptera is presented. This, together with some additional information on the adults, makes it possible to re-appraise some of the supraspecific taxa as established by THEISCHINGER (1983) and should enable to identify larvae to the level of those groups and in some cases to the species.

Material and methods

Larval material of Megaloptera from eastern and south-western Australia, all of it now in the collection of the author and in the Australian National Insect Collection (ANIC), preserved in 70-80% alcohol, was studied. The diagnostic tools available for identification of the major taxa were used in conjunction with reared material of *Archichauliodes guttiferus* (WALKER), *A. anagaurus* RIEK, *A. plumleyi* KIMMINS and *Protochauliodes biconicus* KIMMINS and with various ways of elimination in order to correlate adults and larvae of most species and to produce a preliminary guide to the Australian Megaloptera larvae.

In the following only brief diagnoses of families, genera and species groups of the Australian Megaloptera and a key to those taxa are given. For identification attempts beyond that level the distributional overviews may be useful.

Systematics

Family Corydalidae (Figs 1-47)

Remarks: All Australian Corydalidae belong to the subfamily Chaulioidinae.

Larvae: Abdomen with 8 pairs of lateral processes (gills); apical segment of abdomen with pair of prolegs but without terminal filament.

Adults: Three ocelli. Fourth tarsal segment simple. Conspicuous pigment spots in wings.

Distribution in Australia: Eastern Australia, south-western Australia.

Genera: *Apochauliodes* THEISCHINGER, *Archichauliodes* WEELE, *Protochauliodes* WEELE.

Archichauliodes group (Figs 1-42)

Larvae: Head and pronotum rather smooth, with only scattered long hairs. Left mandible with 4, right mandible with 3 teeth on inner margin (in addition to apical tooth). Apical two segments of antennae combined about as long as segment 2. Thorax and abdomen without prominent intersegmental lobes. Posterior pair of spiracles each raised (generally) or not raised (rarely) on a definite stalk. Lateral processes of abdominal segments 1-5 longer than width of respective segment.

Adults: 2A of forewing connected to 1A by a crossvein. Female valves without lateral stylus.

Distribution: Australia, New Zealand, Chile.

Genera: *Apochauliodes* THEISCHINGER, *Archichauliodes* WEELE.

Genus *Apochauliodes* THEISCHINGER (Figs 1-10)

Apochauliodes THEISCHINGER 1983: 80 (as subgenus of *Archichauliodes* WEELE).

Type species: *Archichauliodes (Apochauliodes) cervulus* THEISCHINGER 1983.

Larvae (Figs 1-6): Labium not produced medially, truncate. Segment 2 of labial palp not much longer than segment 1. Posterior pair of spiracles each raised on a long stalk. Lateral abdominal processes with short hair, those of segments 1-5 distinctly longer than width of respective segment.

Adults (Figs 7-10): Forewing with CuA simple; male anal claspers bifid, with laterobasal callosity not protruding; aedeagus bifid, symmetrical.

Distribution: South-western Australia.

Species: *Apochauliodes cervulus* (THEISCHINGER).

Larvae studied: Western Australia: Barlee Brook, S of Nannup; Carey Brook, nr Pemberton; Pemberton.

Genus *Archichauliodes* WEELE (Figs 11-42)

Archichauliodes WEELE 1909: 258.

Type species: *Hermes diversus* WALKER 1853.

Larvae (Figs 11-16, 25-42): Labium produced medially. Segment 2 of labial palp much longer than segment 1. Posterior pair of spiracles each raised (generally) or not raised (rarely) on a definite stalk. Lateral abdominal processes generally with short, rarely with long hair, those of segments 1-5 generally slightly longer than width of respective segment.

Adults (Figs 17-24): Forewing with CuA forked; male anal claspers simple, with laterobasal callosity prominent; aedeagus simple or bifid, symmetrical or asymmetrical.

Distribution: Eastern Australia, New Zealand, Chile.

Subgenera: *Archichauliodes* WEELE, *Riekochauliodes* subgen. nov.

Subgenus *Archichauliodes* WEELE (Figs 11-20)

Archichauliodes WEELE 1909: 258.

Type species: *Hermes diversus* WALKER 1853.

Remarks: It is assumed that all available larval material belongs to *A. anagaurus* RIEK.

Larvae (Figs 11-16): Posterior tooth of mandibles generally larger than median tooth. Posterior pair of spiracles each not raised on a definite stalk.

Adults (Figs 17-20): Forewing with rows of dark spots mostly on longitudinal veins; pigment spots of hindwing hardly enlarged. Aedeagus bifid, symmetrical.

Distribution: Eastern Australia, New Zealand, Chile.

Species in Australia: *Archichauliodes* (A.) *anagaurus* RIEK, A. (A.) *simpsoni* THEISCHINGER.

Distributions: *A. anagaurus* is widely distributed mainly in alpine Victoria and south-eastern New South Wales; *A. simpsoni* is known only from Mt Howitt in Victoria.

Larvae studied: New South Wales: Brown Mt; Kiandra; Kosciusko Hotel; Pipers Ck, Mt Kosciusko; Sawpit Ck, Mt Kosciusko; Wragge's Ck, Mt Kosciusko; Wilsons Valley, Mt Kosciusko. Victoria: Mt Buffalo; Watt's R., Healesville.

Subgenus *Riekochauliodes* subgen. nov. (Figs 21-42)

Type species: *Hermes guttiferus* WALKER 1853.

Larvae (Figs 25-42): Posterior tooth of mandibles generally smaller than median tooth. Posterior pair of spiracles each raised on a definite stalk.

Adults (Figs 21-24): Forewing with rows of spots mostly between longitudinal veins; pigment spots of hindwing variably but distinctly enlarged. Aedeagus simple or widely bifid, slightly to strongly asymmetrical.

Name: Dedication to Dr E.F. Riek (Canberra).

Distribution: Eastern Australia.

Species groups: *Archichauliodes* (*Riekochauliodes*) *guttiferus* group, A. (R.) *deceptor* group, A. (R.) *polypastus* group.

***Archichauliodes* (*Riekochauliodes*) *guttiferus* group (Figs 21-30)**

Larvae (Figs 25-30): Stalk of posterior spiracles shorter than half the distance between them; posterior spiracles not markedly larger than spiracles on preceding segments.

Adults (Figs 21-24): Male anal claspers almost straight, much longer than tergum 9; aedeagus simple, asymmetrical.

Species: *Archichauliodes* (*Riekochauliodes*) *guttiferus* (WALKER), A. (R.) *neoguttiferus* THEISCHINGER, A. (R.) *phaeoscius* RIEK, A. (R.) *rieki* THEISCHINGER.

Distributions: *A. guttiferus* is known to occur only south of the Hunter River. A.

rieki seems to be endemic to Carnarvon Range in southern inland Queensland. *A. neoguttiferus* is known only from north of the Hunter River (excluding Carnarvon Range), whereas *A. phaeoscius* has been collected only north from Paluma where it coexists in places (rain-forest) with *A. neoguttiferus*.

Larvae studied: Queensland: Beatrice R., Palmerston N.P.; Behana Gorge, S of Gordonvale; The Boulders, Babinda; Broken R., Eungella N.P.; Crystal Cascades, nr Cairns; upper Curambin Ck; 16 km on Davies Ck Rd, E of Mareeba; Dayboro; 2 km on Mt Edith Rd, Tinaroo Dam; Finch Hatton; Fishery Falls, S of Gordonvale; 30 km S of Gympie; Kirrama S.F. (Western Fall); Little Mulgrave R.; Millstream Falls. New South Wales: Allyn R., at Eccleston; upper Allyn R.; Bobundra Ck, Maffra; Bolairo; Brindabella, A.C.T.; Cabbage Tree Ck, Clyde Mt; Chandler R.; Cotter R., A.C.T.; upper Cotter; Dorrig; Falconer Ck, 3 mi. E of Guyra; Gara R.; Goodradigby R.; Wee Jasper; Kiandra; Major's Ck, Ebor; McLaughlin R.; Monga; Moonbi; Murrumbidgee R.-Eumarella R. Jn; Paddy's R., 6 mi from Cotter, A.C.T.; Peel R.; 7 W Rosebank; Snowy R., Dalgaty. Victoria: Aberfeldy R., Wallhalla Rd; Bright; Mt Buffalo; Bullarook Ck, at Kingston; Wellington R., Licola Rd.

***Archichauliodes (Riekochauliodes) deceptor* group (Figs 31-36)**

Remarks: On the basis of a more or less elongate tergum 9 of the adult male an *A. deceptor* group (species *A. cuspidatus*, *A. deceptor*, *A. glossa*) and an *A. uncinatus* group (species: *A. collifer*, *A. conversus*, *A. lewis*, *A. piscator*, *A. uncinatus*) were distinguished (THEISCHINGER 1983, 1988). It appears that these and other group specific differences in the adults are not reflected in the morphology of the larvae. Only a single group (*A. deceptor* group), including all above species, is now recognised.

Larvae (Figs 31-36): Stalk of posterior spiracles several times as long as wide, markedly longer than half the distance between them; posterior spiracles not markedly larger than spiracles on preceding segments.

Adults: Male anal claspers slightly curved, not longer than tergum 9; aedeagus simple, slightly to strongly asymmetrical

Species: *Archichauliodes (Riekochauliodes) cuspidatus* THEISCHINGER, *A. (R.) deceptor* KIMMINS, *A. (R.) glossae* THEISCHINGER, *A. (R.) collifer* THEISCHINGER, *A. (R.) conversus* THEISCHINGER, *A. (R.) lewis* THEISCHINGER,

A. (R.) piscator THEISCHINGER, *A. (R.) uncinatus* THEISCHINGER.

Distributions: Only one species, *A. deceptor*, is known to occur south of the Expedition Range (24° S); all its published records are from north of the Hunter River. Only recently it has also been found at Black Mtn, A.C.T. Two species, *A. cuspidatus* and *A. glossa*, are known from the Eungella area (20°55'S) and Expedition Range (24° S); of these only *A. cuspidatus* extends to north of Paluma. There are no records of the remaining species (*A. collifer*, *A. conversus*, *A. lewis*, *A. piscator*, *A. uncinatus*) from localities south of Paluma.

Larvae studied: Queensland: Captain Billy Ck, CY; Cheetah Ck, Evelyn Tableland; Cunninghams Gap; 16 km on Davies Ck Rd, E of Mareeba; 2 km on Mt Edith Rd, Tinaroo Dam; Iron Range, Mt Tozer foothills; upper Lankelly Ck, Coen Dist.; McLeod R., 15 km W of Mt Carbine; Mt Lewis; Mossman Gorge; Rocky Ck, Atherton.

***Archichauliodes (Riekochauliodes) polypastus* group (Figs 37-42)**

Larvae (Figs 37-42): Stalk of posterior spiracles several times as long as wide, markedly longer than half the distance between them; posterior spiracles significantly larger than spiracles on preceding segments.

Adults: Male anal claspers strongly bent, not longer than tergum 9; aedeagus widely bifid, strongly asymmetrical.

Species: *Archichauliodes (Riekochauliodes) isolatus* THEISCHINGER, *A. (R.) pictus* THEISCHINGER, *A. (R.) plomleyi* KIMMINS, *A. (R.) polypastus* RIEK.

Distributions: *A. isolatus* is known only from Fraser Island. Records of *A. plomleyi* are available from Victoria and from New South Wales north to Barrington Tops. Both, *A. pictus* and *A. polypastus*, are known from north-eastern New South Wales and south-eastern Queensland.

Larvae studied: Queensland: Lower Bellungui Falls, Lamington N.P.; Binna Burra; Bunya Mts; Flaggy Ck, Mistake Mts, via Laidley; Joalah N.P., Tamborine Mtn. New South Wales: Bowens Ck, Bell; Brown Mtn; Cyde Mt, E slope; Clyde Mt, W slope; Kosciusko Hotel; upper reaches of Middle Harbour, Sydney; Minyon Falls, 10 W Rosebank; Moonbi; Rosebank.

Genus *Protochauliodes* WEELE (Figs 43-47)

Protochauliodes WEELE 1909: 258.

Type species: *Hermes diversus* WALKER 1853.

Austrochauliodes RIEK 1954: 137.

Type species as indicated: *Hermes dubitatus* WALKER 1853; de facto: *Protochauliodes biconicus* KIMMINS 1954.

Remarks: At present at least three geographical groups of species are included in *Protochauliodes*. The Australian, South American and North American components may in fact constitute discrete taxa. It is possible that *Austrochauliodes* RIEK will have to be reinstated for the Australian group of species [after comprehensive study and decision by the ICZN (International Commission on Zoological Nomenclature) on the type species of *Austrochauliodes*]].

Larvae: (Figs 43-47): Head and pronotum covered with fine hairs. Both mandibles with 3 teeth on inner margin (in addition to apical tooth). Labium slightly produced medially with apex slightly bilobed, very hairy. Segment 2 of labial palps almost twice as long as segment 1. Apical two segments of antennae combined much shorter than segment 2. Thorax and abdomen generally with prominent intersegmental lobes. Spiracles on abdominal segment 8 only slightly raised (stalked). Lateral processes of abdominal segments 1-5 shorter than respective segment.

Adults: 2A of forewing fused to 1A for part of its length. Female valves with lateral stylus.

Distribution: Eastern Australia, Chile, western North America.

Species in Australia: *Protochauliodes biconicus* KIMMINS, *P. kirramae* THEISCHINGER, *P. eungella* THEISCHINGER.

Distributions: Several subspecies and local forms of *P. biconicus* are known from New South Wales and south-eastern Queensland. *P. eungella* is only known from the Eungella area, whereas *P. kirramae* has been found only north from Paluma.

Larvae studied: Queensland: Broken R., Eungella N.P.; Bunya Mts; Big Falls, Bunya Mts; Cheetah Ck, Evelyn Tableland; The Crater, SW of Malanda; Cunninghams Gap; 16 km on Davies Ck Rd, E of Mareeba; Flaggy Ck, Mistake Mts, via Laidley; Kirrama S.F.; Little Crystal Ck, Mt Spec; Beatrice R., Palmerston N.P. New South Wales: Clyde Mt; Fitzroy Falls; Mt Keira;

Major's Ck, Ebor; upper reaches of Middle Harbour, Sydney; Newell Falls; Styx R., at Hyatts Flat.

Family Sialidae (Figs 48-52)

Remarks: The available larvae appear very homogeneous. They probably belong to a single species (*Stenosialis australiensis*).

Larvae (Figs 48-52): Abdomen with 7 pairs of lateral processes (gills); apical segment of abdomen without prolegs but with terminal filament.

Adults: Ocelli wanting. Fourth tarsal segment prominently bilobed. Wings without conspicuous pigment spots.

Distribution in Australia: Eastern Australia.

Genera: *Austrosialis* TILLYARD, *Stenosialis* TILLYARD.

Larvae studied: Queensland: Beatrice R., Palmerston N.P.; Lake Eacham; 30 km S of Gympie.

Genus *Austrosialis* TILLYARD

Austrosialis TILLYARD 1919: 821.

Type species: *Austrosialis ignicollis* TILLYARD 1919.

Larvae: Diagnostic characters not available.

Adults: Forks of Rs, MA, MP and CuA subequal in length. Sternum 8 of female long, significantly incised posteromedially.

Species: *Austrosialis ignicollis* TILLYARD, *A. maxmouldsi* THEISCHINGER.

Distributions: Only a few specimens of *A. maxmouldsi* have ever been recorded from north-eastern Queensland, whereas *A. ignicollis* is known only from a unique female from Tasmania.

Genus *Stenosialis* TILLYARD

Stenosialis TILLYARD 1919: 823.

Type species: *Stenosialis australiensis* TILLYARD 1919.

Larvae: Diagnostic characters not available.

Adults: Forks of Rs, MA, MP and CuA very different from each other in length. Sternum 8 of female wide and very short, not incised posteromedially.

Species: Stenosialis australiensis TILLYARD, *S. hollowayi* THEISCHINGER.

Distributions: *S. australiensis* is known from numerous localities of coastal eastern Australia (Cape York-Victoria), *S. hollowayi* only from a few specimens from north-eastern Queensland.

Key to the supraspecific taxa of Australian Megaloptera (larvae)

- 1 Seven pairs of non-articulated, lateral abdominal processes (Fig. 48); apex of abdomen drawn out into a long terminal subanal filament **Family Sialidae**
- Eight pairs of articulated lateral abdominal processes (Figs 1, 11, 25, 43); apical segment of abdomen with a pair of prolegs; functional spiracles on abdominal segment 8, sometimes each drawn out on a stalk **Family Corydalidae, 2**
- 2 Both mandibles with 3 teeth on inner margin (rarely 4-3)(Fig. 44); head and pronotum densely clothed with setae; apical 2 segments of antennae combined much shorter than segment 2 (Fig.47) **Genus Protochauliodes**
- Left mandible with 4, right mandible with 3 teeth (in addition to apical tooth) on inner margin (Figs 2, 12, 26); surface of head and pronotum almost free of setae; apical 2 segments of antennae combined about as long as segment 2 (Figs 5, 15, 29) **Archichauliodes group, 3**
- 3 Second segment of labial palp almost as long as first (Fig. 4); apex of labium not produced, truncate; known only from western Australia **Genus Apochauliodes**
- Second segment of labial palp much longer than first (Figs 14, 28); apex of labium produced, convex, slightly lobed; from eastern Australia **Genus Archichauliodes, 4**
- 4 Spiracles of 8th abdominal segment each only slightly raised (Fig. 16); lateral abdominal processes clothed with long hair (Fig. 11) **Subgenus Archichauliodes**

- Spiracles of 8th abdominal segment each raised on a definite stalk (Figs 30, 36,42); lateral abdominal processes clothed with short hair (Figs 25, 31, 37) **Subgenus Riekochauliodes, 5**
- 5 Spiracles of 8th abdominal segment each on moderately long stalk (Fig. 30); stalks hardly half as long as distance between them **Archichauliodes (Riekochauliodes) guttiferus group**
- Spiracles of 8th abdominal segment each on long stalk (Figs 36, 42); stalks almost as long as distance between them, or longer **6**
- 6 Stalked spiracles of 8th abdominal segment not distinctly larger than spiracles on preceding segments (Fig. 36) **Archichauliodes (Riekochauliodes) deceptor group**
- Stalked spiracles of 8th abdominal segment distinctly larger than spiracles on preceding segments (Fig. 42) **Archichauliodes (Riekochauliodes) polypastus group**

Discussion

Corydalidae: South-western Australian larval and adult material of what was hitherto considered to be *Archichauliodes* WEELE, is quite distinct from eastern Australian material; *Apochauliodes* THEISCHINGER is therefore and reconsidering the diagnostic characters of the adults (THEISCHINGER 1983 and this paper) given generic rank. What remains of Australian *Archichauliodes* can, on the basis of larval and adult characters, be divided into 2 groups one of which (*A. anagaurus* group of THEISCHINGER 1983) appears markedly closer to the type species of *Archichauliodes* from New Zealand and to *Archichauliodes* from South America, than to the other group of Australian species. The *Archichauliodes anagaurus* group is therefore assigned to *Archichauliodes* s. str., whereas a new subgenus, *Riekochauliodes*, is established for the remaining Australian species of *Archichauliodes*. At present larvae of two of the four species groups distinguished by THEISCHINGER (1983) of what is now *Archichauliodes* (*Riekochauliodes*) cannot be separated.

Thus only three species groups of *Archichauliodes* (*Riekochauliodes*) are recognised in this paper. Clearly diagnostic larval characters within the species groups of *Archichauliodes* were not found. The larvae of all species of *Protochauliodes* WEELE are very similar; at present specific identifications of larvae on morphological basis are not possible.

Sialidae: The available larvae from Australia appear very homogeneous. Probably they represent only a single species. Larval diagnoses of the sialid genera *Austrosialis* and *Sienosialis* cannot be given.

Acknowledgements

Dr E.F. Riek (Canberra) recently returned illustrations of adults and larvae of Megaloptera to CSIRO Entomology (Curator of aquatic insects Dr P.S. Cranston). These illustrations were done by Mrs S. Monteith (Brisbane) more than two decades ago. I wish to thank Mrs S. Monteith, Dr E.F. Riek and Dr P.S. Cranston for giving me the opportunity to use some of those illustrations.

Zusammenfassung

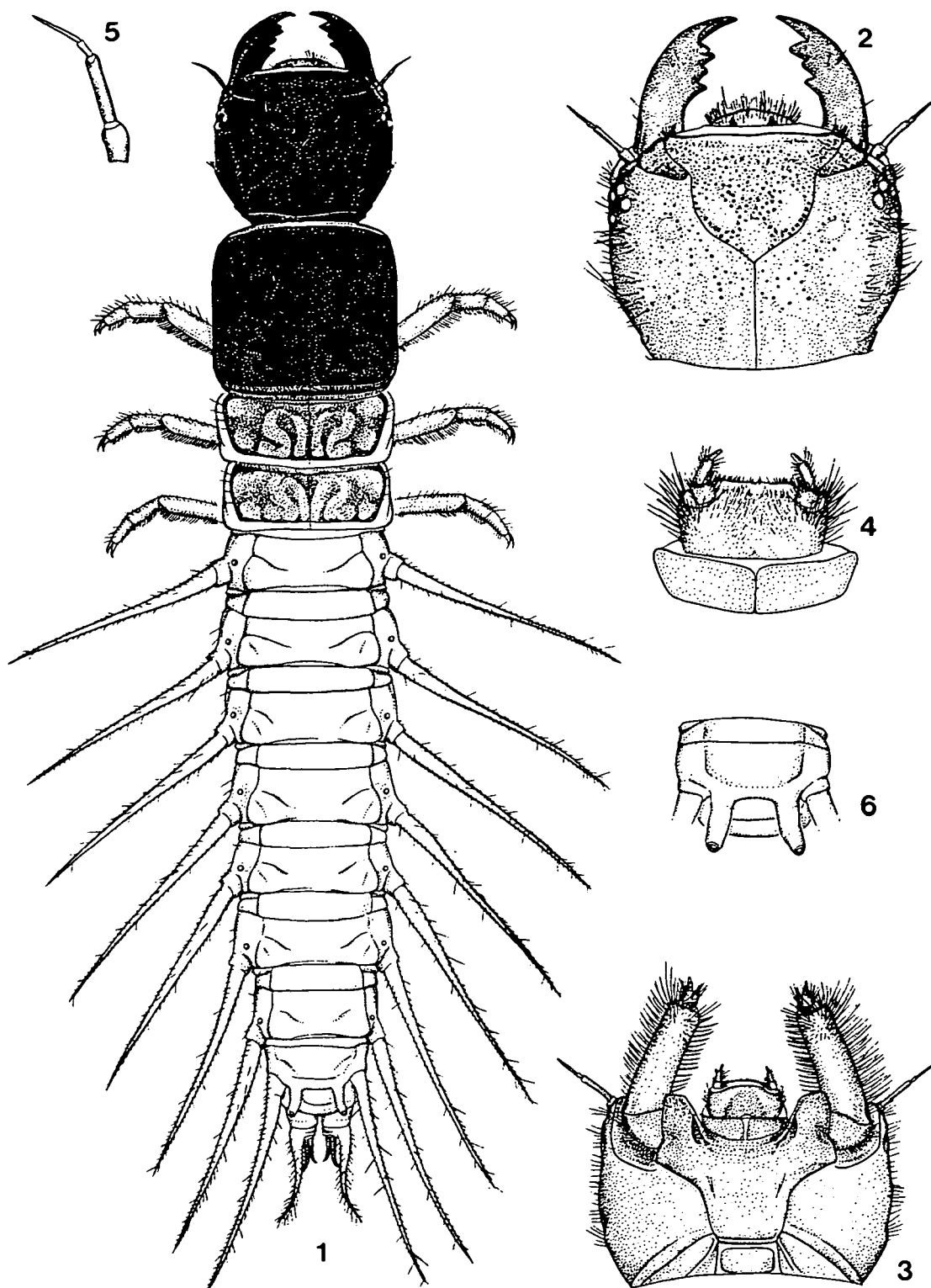
Die verfügbare Information über die Larven der australischen Megalopteren wird zusammenfassend unter dem Gesichtspunkt der Beurteilung der Systematik einiger supraspezifischer Taxa diskutiert. *Apochauliodes* THEISCHINGER, ursprünglich als Subgenus von *Archichauliodes* WEELE beschrieben, wird in den Genus-Rang erhoben. Ein neues Subgenus, *Riekochauliodes*, wird für den Großteil der australischen Spezies von *Archichauliodes* errichtet. Nur drei der vier Spezies-Gruppen von *Archichauliodes* (*Riekochauliodes*), die auf Grund imaginaler Merkmale abgegrenzt werden können, lassen sich auch auf der Basis larvaler Merkmale unterscheiden. Es wird ein Bestimmungsschlüssel der Larven der australischen Megalopteren (soweit möglich) präsentiert, für die meisten Spezies werden detaillierte Angaben zur Verbreitung gegeben, womit eine Basis für weitergehende Studien vorliegt.

References

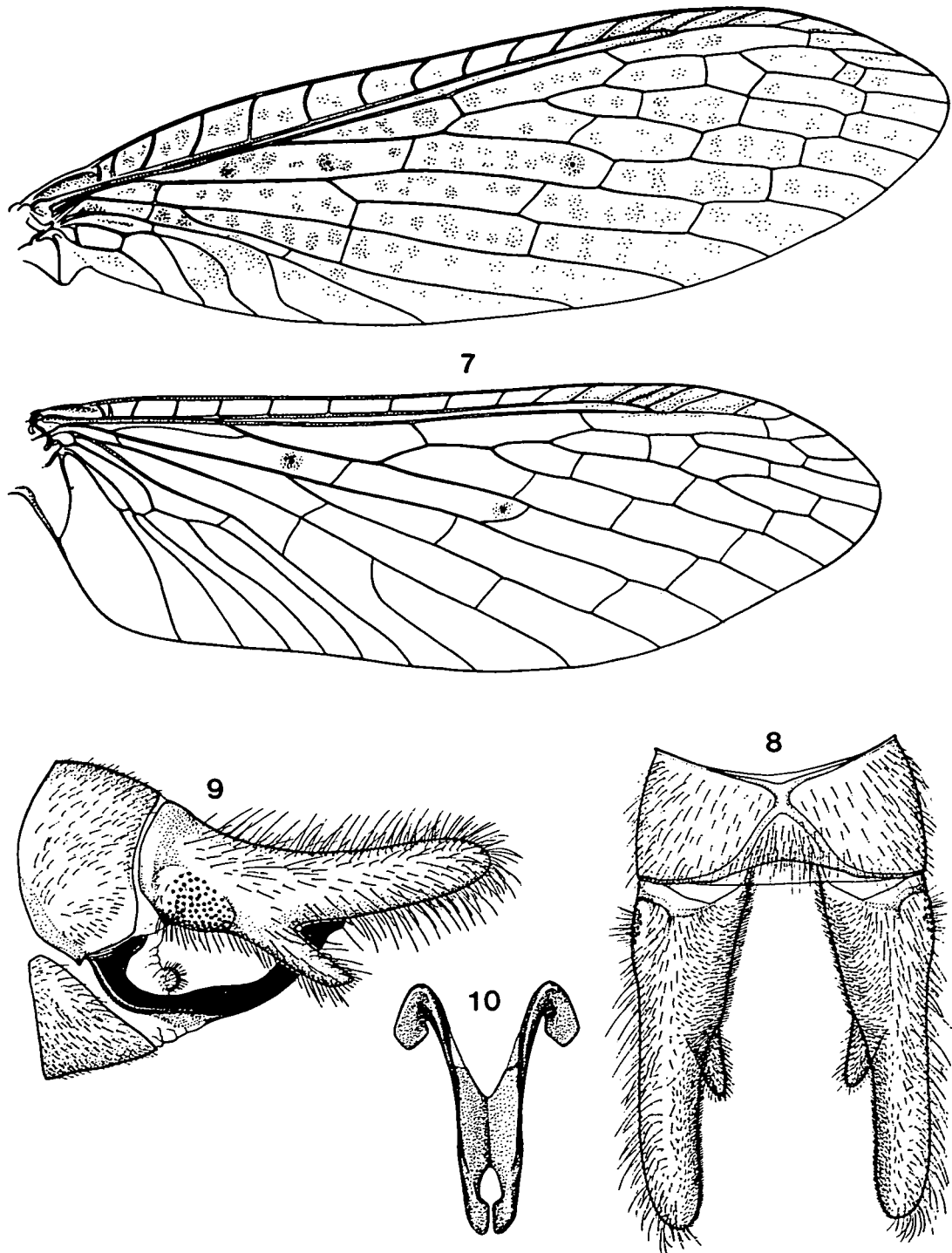
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Anschrift des Verfassers:

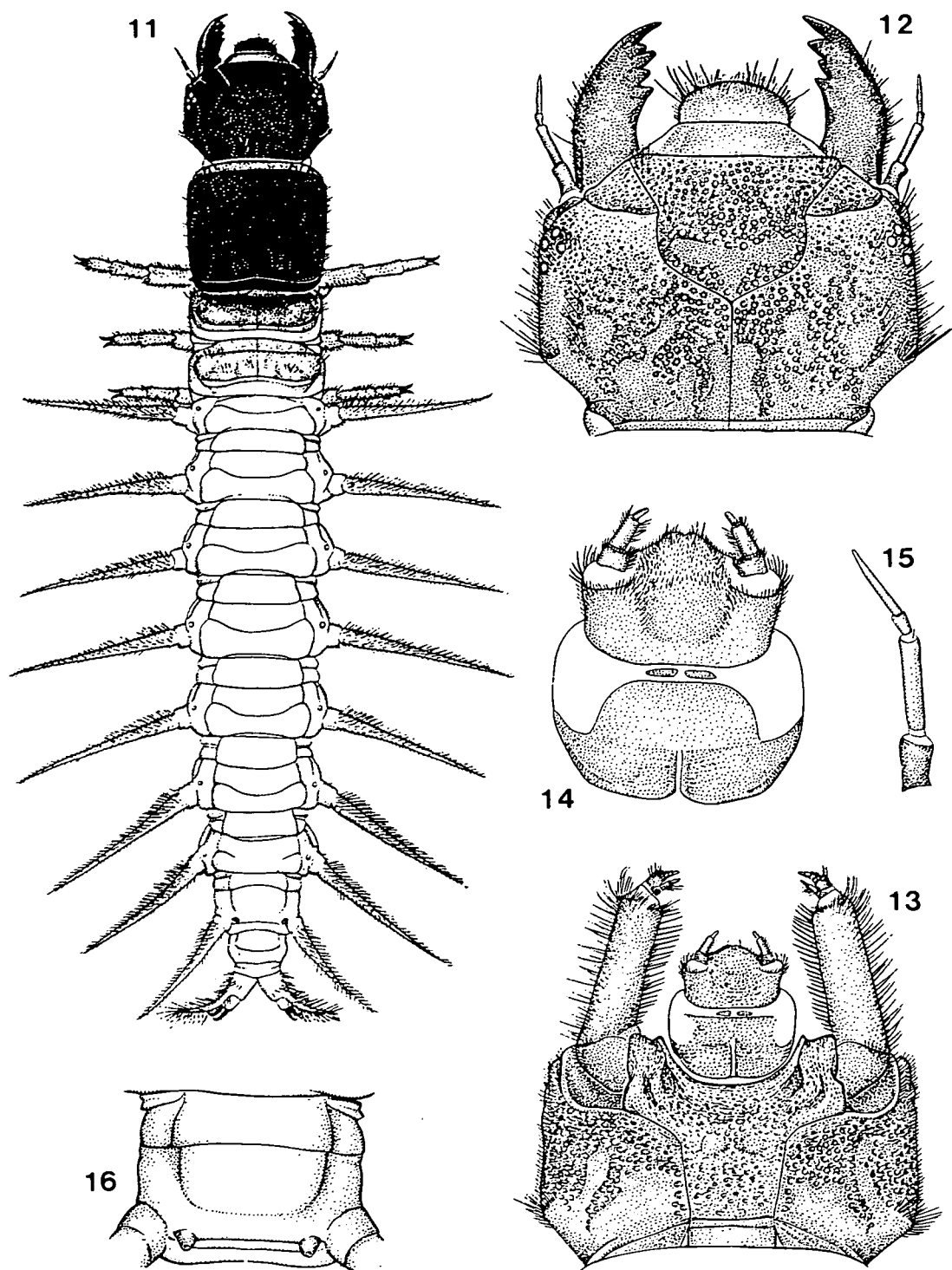
Günther THEISCHINGER
2a Hammersley Rd, Grays Point
N.S.W., Australia 2232



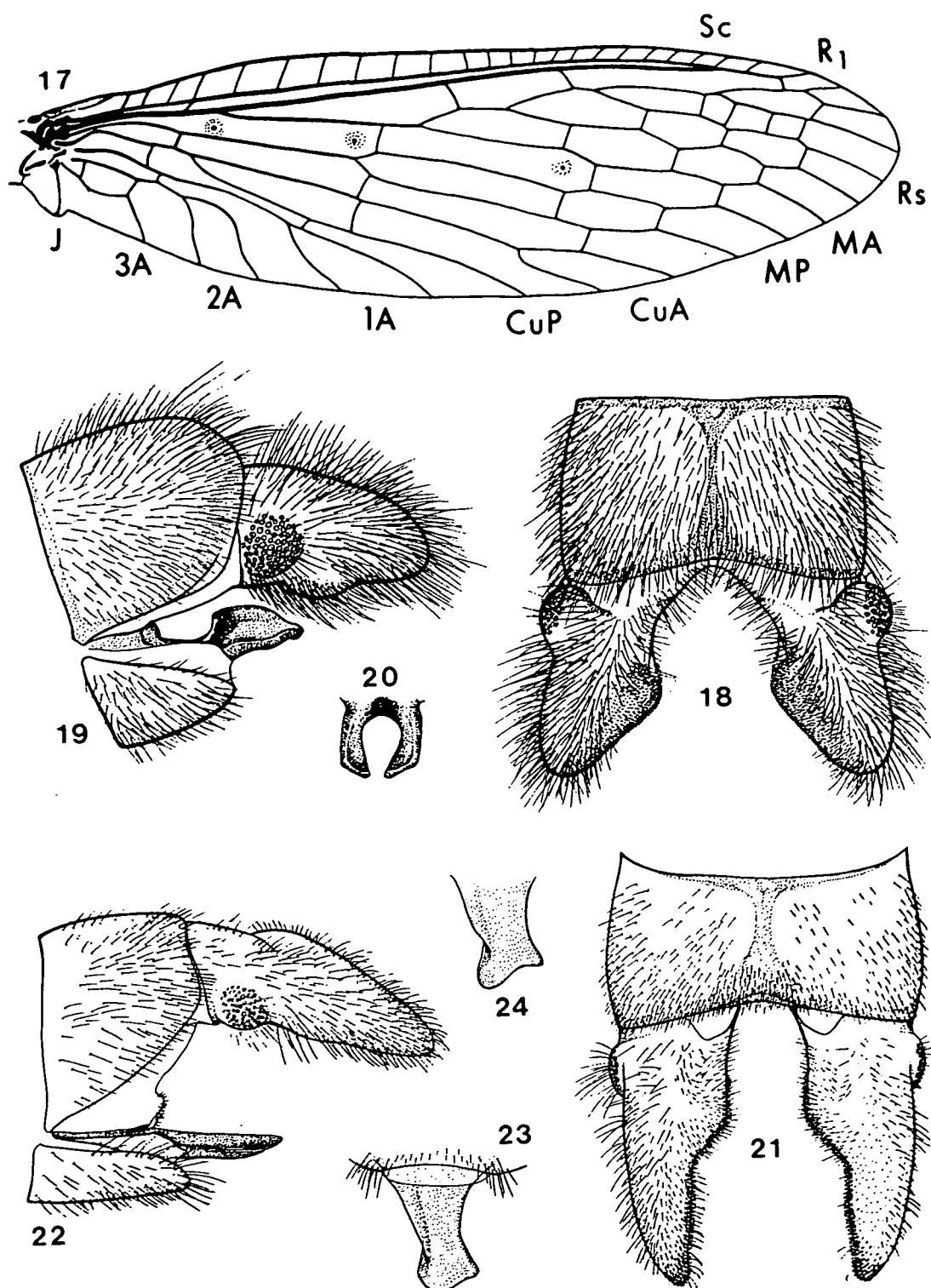
Figs 1-6: *Apochauliodes cervulus* (THEISCHINGER), larva: 1 - habitus, dorsal aspect; 2 - head, dorsal aspect; 3 - head, ventral aspect; 4 - labium and palps; 5 - antenna; 6 - segment 8, dorsal aspect.



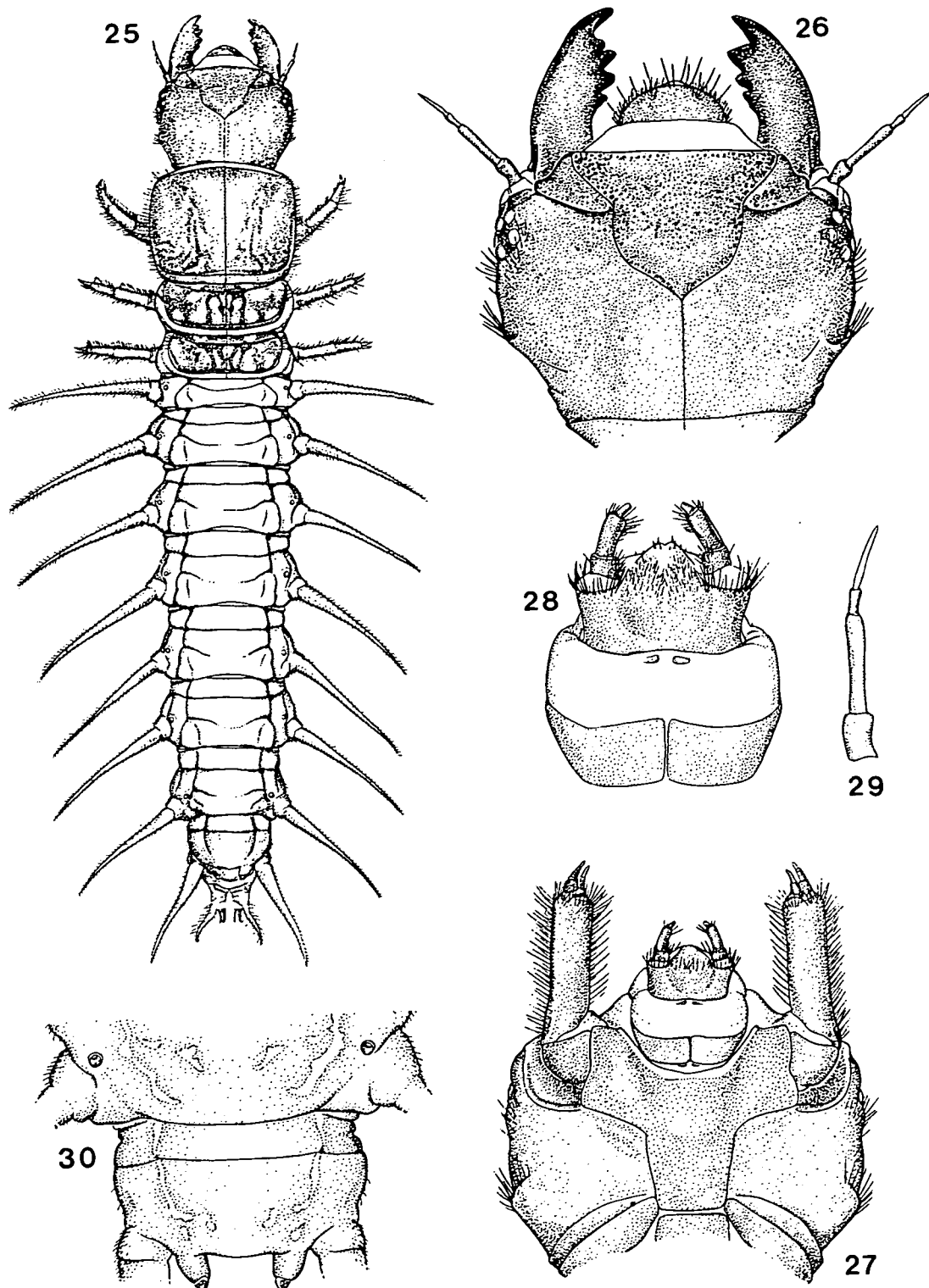
Figs 7-10: *Apochauliodes cervulus* (THEISCHINGER), male: 7 - wings; 8, 9 - anal claspers: 8 - dorsal aspect; 9 - lateral aspect; 10 - aedeagus, ventral aspect.



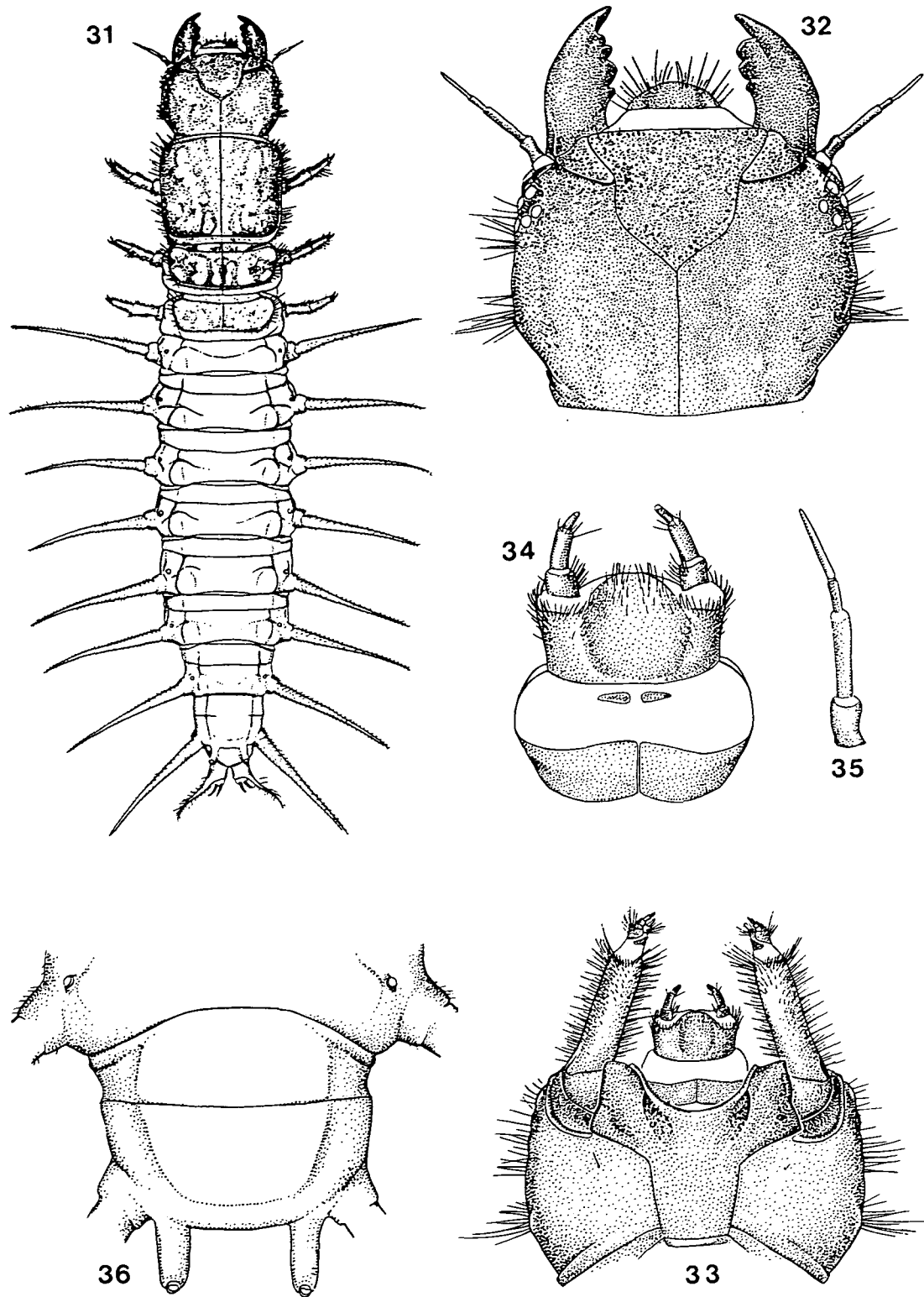
Figs 11-16: *Archichauliodes (Archichauliodes) anagaurus* RIEK, larva: 11 - habitus, dorsal aspect; 12 - head, dorsal aspect; 13 - head, ventral aspect; 14 - labium and palps; 15 - antenna; 16 - segment 8, dorsal aspect.



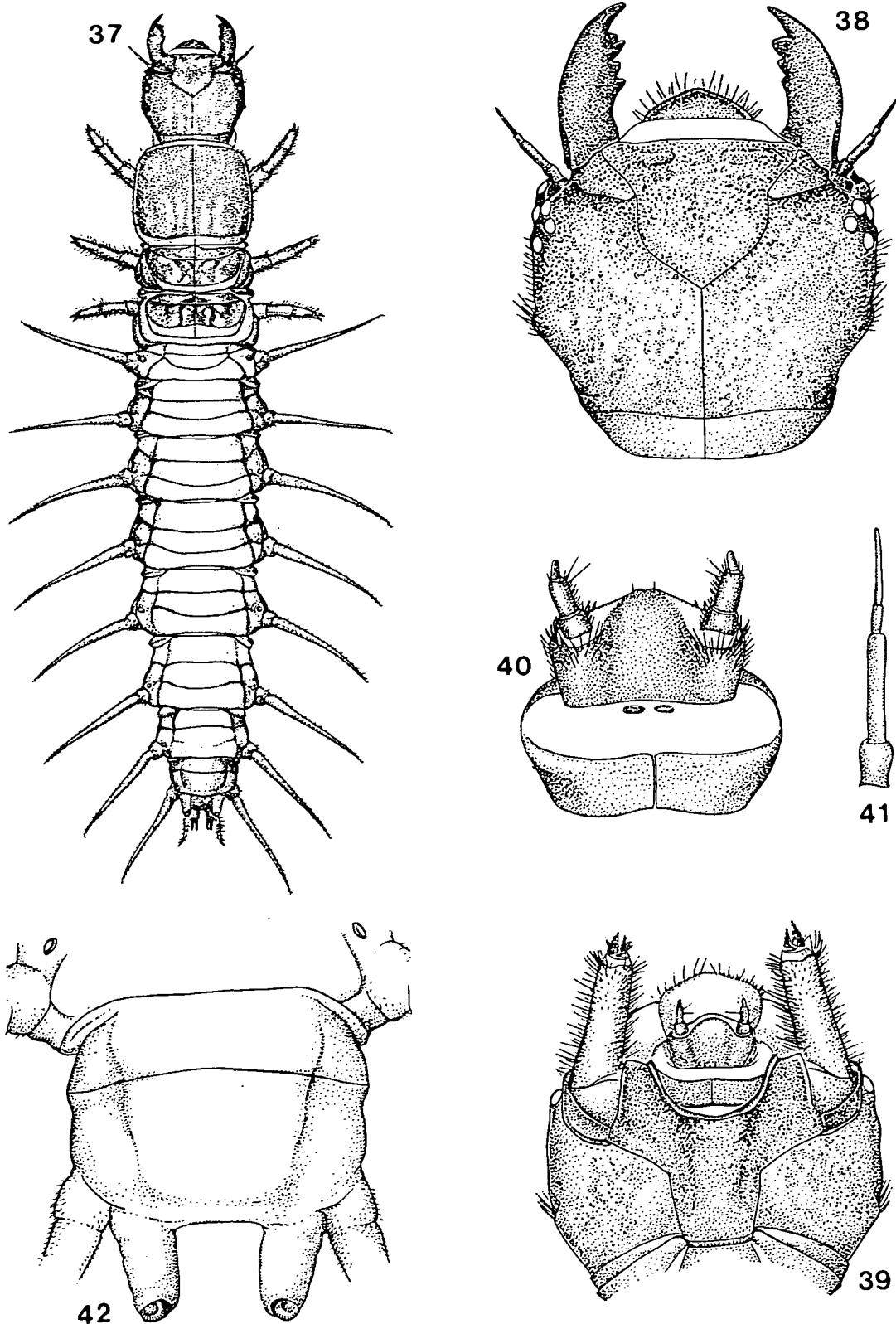
Figs 17-20: *Archichauliodes (Archichauliodes) anagaurus* RIEK, male: 17 - forewing; 18, 19 - anal claspers: 18 - dorsal aspect; 19 - lateral aspect; 20 - aedeagus, ventral aspect. Figs 21-24: *Archichauliodes (Riekoichauliodes) guttiferus* (WALKER), male: 21, 22 - anal claspers: 21 - dorsal aspect; 22 - lateral aspect; 23, 24 - aedeagus of two different specimens, ventral aspect.



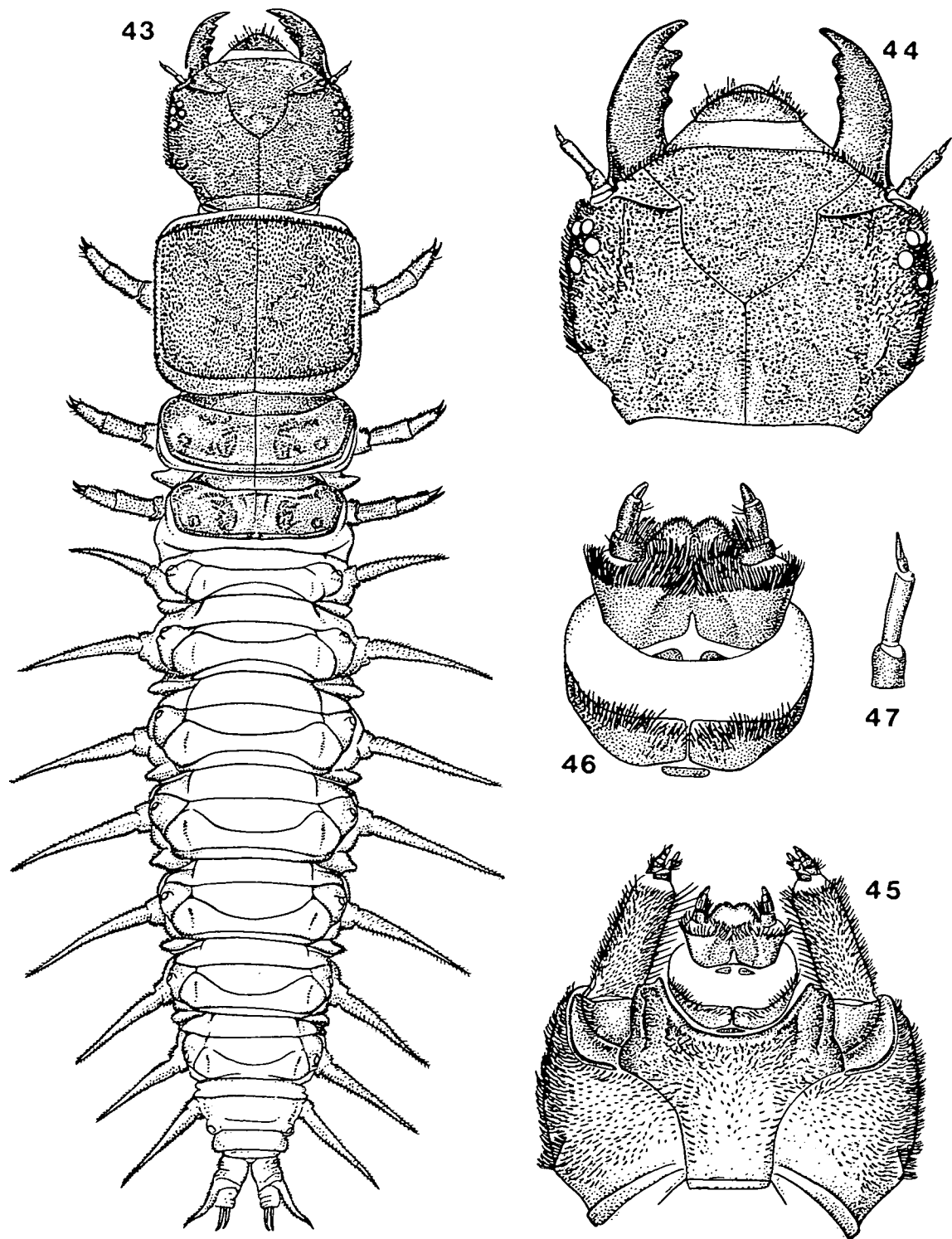
Figs 25-30: *Archichauliodes (Riekochnauliodes) guttiferus* (WALKER), larva: 25 - habitus, dorsal aspect; 26 - head, dorsal aspect; 27 - head, ventral aspect; 28 - labium and palps; 29 - antenna; 30 - segment 8, dorsal aspect.



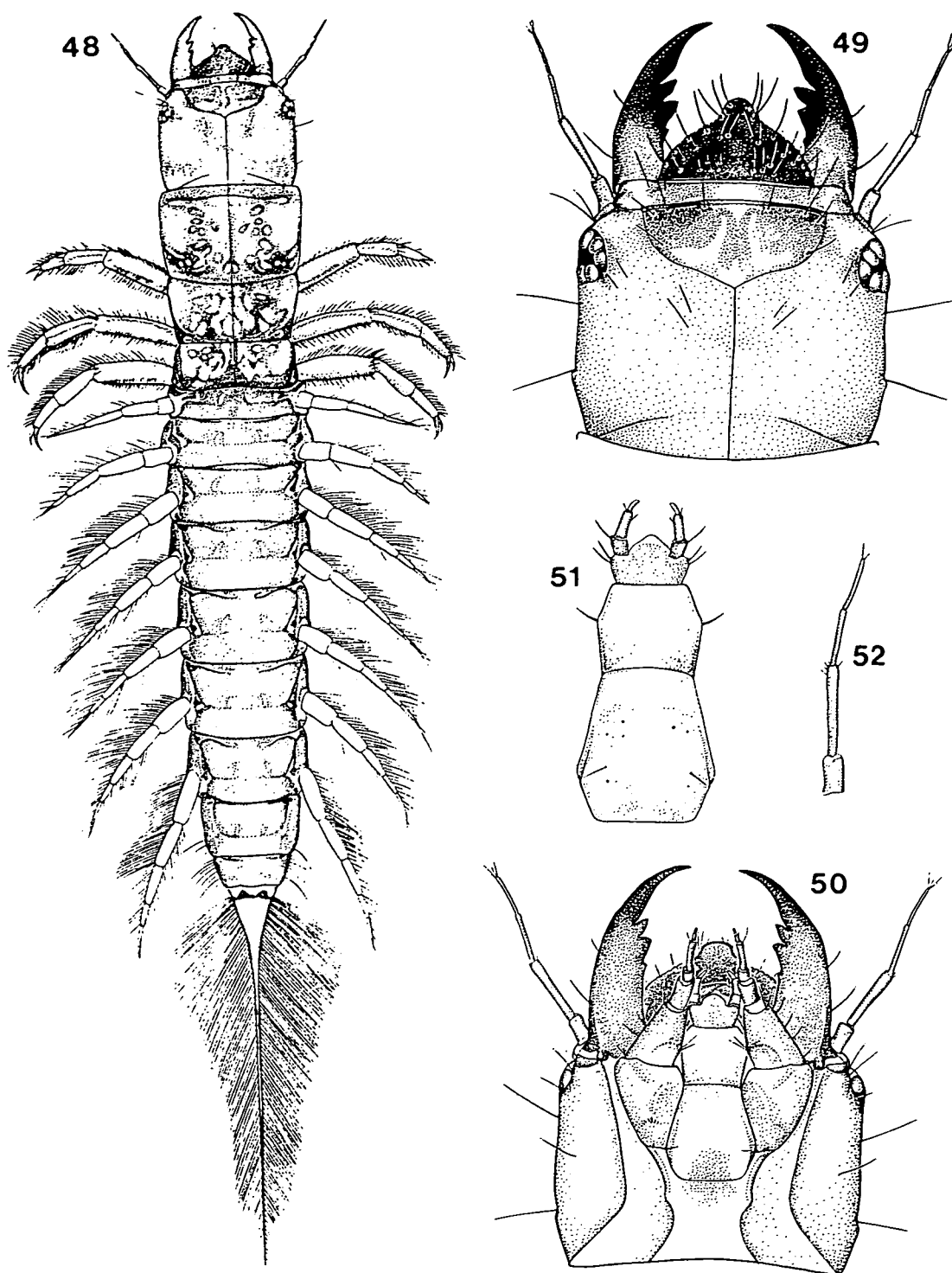
Figs 31-36: *Archichauliodes (Riekochauliodes) uncinatus* THEISCHINGER, larva: 31 - habitus, dorsal aspect; 32 - head, dorsal aspect; 33 - head, ventral aspect; 34 - labium and palps; 35 - antenna; 36 - segment 8, dorsal aspect.



Figs 37-42: *Archichauliodes* (*Riekochauliodes*) ?*polypastus* RIEK, larva: 37 - habitus, dorsal aspect; 38 - head, dorsal aspect; 39 - head, ventral aspect; 40 - labium and palps; 41 - antenna; 42 - segment 8, dorsal aspect.



Figs 43-47: *Protochauliodes biconicus* KIMMINS, larva: 43 - habitus, dorsal aspect; 44 - head, dorsal aspect; 45 - head, ventral aspect; 46 - labium and palps; 47 - antenna.



Figs 48-52: *?Stenosialis spec.*, larva: 48 - habitus, dorsal aspect; 49 - head, dorsal aspect; 50 - head, ventral aspect; 51 - labium and palps; 52 - antenna.

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