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Thrypticus and an Allied New Genus, *Corindia,* from Australia (Diptera: Dolichopodidae)

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ABSTRACT. *Corindia* n. gen. and Australian *Thrypticus* Gerstäcker are described, including nine and three new species, respectively: *C. major, C. minor, C. capricornis, C. collessi, C. nigricornis, C. robensis, C. cooloola, C. torresiana* and *C. trudis; T. australis, T. tropicus* and *T. fortescuensis.* The two genera have a sister-group relationship and their phylogenetic position within the subfamily Medeterinae is discussed. A lectotype is designated for *T. abditus* Becker. The New Zealand *Thrypticus nigrichaetus* Parent is regarded as *Chrysotimus nigrichaetus* (Parent), new combination.

BICKEL, DANIEL J., 1986. *Thrypticus* and an allied new genus, *Corindia,* from Australia (Diptera: Dolichopodidae). Records of the Australian Museum 38(3): 135–151.

While field collecting and sorting specimens in preparation for a monograph on the Indo-Australian *Medetera* Fischer von Waldheim, I have isolated a group of species which represent a new genus, *Corindia,* in the dolichopodid subfamily Medeterinae. All nine included new species are from Australia. Because of its close phylogenetic relationship with the cosmopolitan genus *Thrypticus,* I have also included a revision of the Australian members of this genus.

The Medeterinae is superficially distinguished from all other dolichopodid subfamilies by the following combination of characters: posterior mesoscutum distinctly flattened; femora II and III lacking anterior preapical bristles; hypopygium large, on elongate peduncle formed by abdominal segment 7; antennal scape without dorsal setae; arista apical; dorsal postcranium strongly concave; vein M unbranched and lacking a flexion (or *bosse alaire* of Parent) in the distal sector; frontoclypeal suture distinct, usually marked by a band of pruinosity; hypopygium with distal surstyli, divided into dorsal and ventral lobes; epandrial seta present ventrobasally; pair of epandrial lobes arising distally along ventral margin near base of surstylus, and each lobe bearing strong bristle (for further information on the Medeterinae, see Negrobov, 1971–77, and Bickel, 1985). The three included Australian genera, *Medetera, Corindia* and *Thrypticus,* are distinguished in the text key.

Materials and Methods

All measurements are in millimetres except for the podomere ratios which represent the relative lengths of the leg segments as given in the following formula: femur; tibia; tarsomere 1/2/3/4/5. The CuAx ratio is the quotient of lengths: m-cu crossvein/distal segment of CuA, from crossvein to wing margin. The morphological terminology follows McAlpine (1981) and Bickel (1985). In describing the hypopygium, 'dorsal' and 'ventral' refer to morphological position prior to genitalic rotation and flexion. Thus, in figures showing a lateral view of the hypopygium, the top of the page is morphologically ventral, while the page bottom is dorsal. The position of features on elongate structures is given as a fraction of the total length, starting from the base.

The following abbreviations were used:

AMS	Australian Museum, Sydney
ANIC	Australian National Insect Collection, Canberra
NVM	Museum of Victoria, Melbourne
NZAC	New Zealand Arthropod Collection, Auckland
SAM	South Australian Museum, Adelaide
USNM	United States National Museum, Washington, D.C.
ZMUA	Zoologisch Museum, Amsterdam

Key to Genera of Australian Medeterinae and Species of *Corindia* and *Thrypticus*

1. Wing vein M distinctly curving towards R_{4+5} beyond m-cu crossvein; coxa III with only 1 lateral seta; eyes bare; 2 supraalars (sa) present, the posterior stronger and anterior weaker; femur II without posterior subapical seta; anal vein usually distinct; body coloration usually black or dark metallic green; hypandrium arising mid-ventrally from epandrium. ..... *Medetera*

——R_{4+5} and M parallel to apex; coxa III with 2 lateral setae; eyes with short hairs between facets; only 1 supraalar (sa) present; femur II with strong posterior subapical seta; anal vein indistinct or absent; body coloration usually bright metallic green; hypandrium arising basoventrally from epandrium. 2

2. Female oviscapt broad, cylindrical, with 2 pairs of dorsal spines (Figs 4, 5); epandrial lobes separate, each bristle arising from a short basal collar; surstylus not strongly deflexed dorsad; cerci not conforming to dorsal surstylar margin; cerci with long distolateral arms, much longer than the broad cercal base from which they arise; anal vein present as weak fold; CuAx ratio > 0.5, i.e., m-cu relatively close to posterior margin of wing; aedeagus usually with deep apicoventral notch. ..... *Corindia* ... 3

——Female oviscapt blade-like, sclerotized, narrow in dorsal view (Figs 23, 24); epandrial lobes fused into elongate collar from which the 2 bristles arise; surstylus strongly deflexed dorsad, usually lying conformably with similarly deflexed, oblong-shaped cerci; cerci without distolateral arms; CuAx ratio usually < 0.5, i.e., m-cu somewhat distant from posterior margin of wing; aedeagus usually bifurcate apically. ..... *Thrypticus* ... 11

3. Antenna entirely dark brown. 4

——Antennal scape and pedicel yellow or red-yellow. 6

4. Male femur III with a mid-ventral cuticular projection bearing a tapering seta (Fig. 13); legs dark brown; thoracic setae black; ventral arm of surstylus with stout conical seta, subtended along ventral margin by a strong curved seta; a striated blade-like seta arising on a pedicel between the dorsal and ventral surstylar arms (Fig. 12). ..... *C. trudis*

——Male femur III unmodified; at least tibiae yellowish; thoracic setae yellow-brown. 5

5. Hypandrium with paired ventral thorn-like projections at 5/6; surstylus with distinctive dorsoapical clavate projection, and with long hooked seta; cercus with elongate bare distolateral arm (Fig. 15). ..... *C. robensis*

——Hypandrium without flexion or ventral projections; surstylus with distinctive dorsal subapical cuticular hook; cercus with short distolateral arm (Fig. 14). ..... *C. nigricornis*

6. Aedeagus with strong dorsal triangular projection; surstyli with short curved seta on ventral margin; hypandrium with only slight bumps near hypandrial flexion (Fig. 7). ..... *C. collessi*

——Aedeagus clavate, apically expanded (e.g. Fig. 1); surstyli without a short stout curved seta on ventral margin; hypandrium with a pair of ventral thorn-like projections near flexion. 7

7. Distolateral cercal arm stout, with long curved apical setae as long as arm itself (Figs 1, 2); surstyli wide in lateral view, arising from an elongate epandrium; female abdominal terga 1, 2 yellowish; length > 2.3. ..... *C. major*

——Distolateral cercal arm peg-like, with straight apical setae, not longer than 2/3 length of arm; surstyli relatively narrow in lateral view, arising out of bulbous epandrium; female abdomen unicolorous metallic green; length < 2.1. 8

8. Hypandrium apically clavate, with ventral thorn-like projections and flexion at ⅔; surstylus with distinctive curved dorsal arm (Fig. 9). ..... *C. minor*

——Hypandrium slightly tapering or subparallel apically, with ventral thorn-like projections at ⅚; ventral surstylar arm arising medially, partially hidden in lateral view by longer dorsal arm. 9

9. Coxa I, femora dark brown; dorsal surstylar arm blunt, apex curved medially (Fig. 11); strong dorsal setae along distolateral arm of cercus; epandrial lobes arise internally such that lobe bases hidden in lateral view. ..... *C. torresiana*

——Coxa I, femora yellowish; dorsal surstylar arm tapering, fingerlike, not curved medially; at least middle section of distolateral arm of cercus bare, without dorsal setae. 10

10. Dorsal surstylar arm short and curved; distolateral cercal arm with strong seta at ¾ (Fig. 10). ..... *C. capricornis*

——Dorsal surstylar arm elongate, straight; distolateral cercal arm with only strong apical setae (Fig. 16). ..... *C. cooloola*

11. Hypandrium beyond flexion triangular, broad basally, tapering distally, and heavily melanized (Fig. 18); surstylus with 2 distal short setae and strong ventral seta at ⅔ (Fig. 17). ..... *T. australis*

——Hypandrium beyond flexion parallel-sided, narrow, with only slight basal melanization (Fig. 20). 12

12. Surstylus relatively long, as long as epandrium; apex of aedeagus not reaching distal margin of surstylus; surstylus rounded distally; strong seta present at ⅔ along ventral margin of surstylus; body colour distinctly metallic blue-green (Fig. 22). ..... *T. fortescuensis*

——Surstylus shorter, distinctly shorter than epandrium; apex of aedeagus reaching distal margin of surstylus; surstylus projecting dorsally somewhat; strong seta present subapically on ventral margin of surstylus; body colour bright metallic green (Fig. 19). ..... *T. tropicus*

Genus *Corindia* n. gen.

Type species. *Corindia major* n. sp.

Diagnosis. Body colouration usually bright metallic green; eyes with short hairs between facets; only 1 sa present; coxa III with 2 lateral setae; femur II with strong posterior subapical seta; wing veins R_4+_5 and M parallel to apex; CuAx ratio > 0.5, i.e., m-cu relatively close to posterior margin of wing; anal vein present as weak fold; hypandrium arising basoventrally from epandrium, and usually with a flexion or indentation in distal third; hypopygial foramen in left basolateral position; aedeagus usually with deep apicoventral notch; epandrial seta strong, curved, internal, not visible in lateral view; epandrial lobes separate, each bristle arising from a short basal collar; surstylus not strongly deflexed dorsad; ventral margin of cercus not conforming to dorsal surstylar margin; cerci with long distolateral arms, much longer than the broad cercal base from which they arise; female oviscapt broad, cylindrical, with 2 pairs of dorsal spines.

Description. The following description of *Corindia* is based on the nine included new species.

HEAD: postcranium strongly concave dorsally; vertex slightly excavated, ocelli on small tubercle; single pairs of vertical, ocellar and short postvertical setae present; frons, face slightly wider in females than in males, usually bright metallic green-blue, of coriaceous texture, and sometimes with faint longitudinal furrows; frontoclypeal suture complete, marked above by transverse band of pruinosity; clypeus metallic green-blue; antennal pedicel and scape short, usually yellowish; 1st flagellomere subrectangular, dark brown; arista apical, bare, about 1½ head height in length; eyes with short setulae between facets; palpi black with strong apical seta; proboscis dark brown, relatively small, not massive and heavily sclerotized as in many *Medetera;* labrum not elongated; epipharyngeal armature with 2 prongs; labella with 6 pseudotracheae, ribbon-like, unsclerotized (mouthpart structure similar to Group IV of Cregan, 1941); single row of pale postorbitals, ventralmost strong, projecting over posterior portion of proboscis; ventral postcranium with few scattered pale setae.

THORAX: posterior portion of mesonotum distinctly flattened, even slightly concave; colour metallic blue or green, with thin pruinose covering; 10–12 pairs acrostichals (ac) present, ending before mesonotal

depression, about as long as width of ac band; 5 strong dorsocentrals (dc) present, decreasing in size anteriorly, anteriormost just in front of mesonotal suture, with anterior short setulae which extend laterally as a field towards postpronotum (humeral callus); 1 postalar (pa) present; only 1 postsutural supraalar (sa) present, corresponding to posterior sa of the 2 sa in *Medetera;* 1 presutural intraalar (sr), 1 strong presutural supraalar (pm), 2 short postpronotals (hm) present; 2 notopleurals (npl) present, almost adjacent, positioned much closer together than in *Medetera;* 1–3 proepisternals (ppls); paired median and lateral marginal scutellar bristles present, laterals reduced to weak hairs, usually less than ⅓ length medians.

LEGS: coxae I and II with short anterior setulae; coxa III with 2 lateral bristles, dorsal longer than ventral; femur II with strong posterior subapical seta; tibia II with anterodorsal seta at ¼ (posterodorsal absent), and with strong ventral apicals; all legs with paired apical claws.

WINGS: hyaline; R_{4+5} and M parallel to wing margin (Fig. 6); anal vein as weak fold almost to margin; anal cell indistinct; CuAx ratio greater than 0.5, i.e., m-cu crossvein relatively close to posterior wing margin.

ABDOMEN: cylindrical with short setulae; terga 2–5 with 2–3 ovoid depressions along lateral margins; male sterna modified to receive hypopygium, which at rest is tucked up and slightly enfolded by the abdomen so that surstylar tips are held near coxa III; male sterna 6 and 7 reduced to narrow bands, sterna 3–5 mid-ventrally weakly sclerotized and concave, with marginal excavations posteriorly; female sterna normal, forming collar-like bands without posterior excavations; spiracles present in membrane between terga and sterna 1–6.

MALE POSTABDOMEN: tergum and sternum 7 fused and somewhat rotated to left lateral position, forming trapezoidal hypopygial peduncle pivoting on tergum 6; sternum 8 forming cap over hypopygial foramen, tergum 8 absent; hypopygium with epandrium (= tergum 9) forming elongate, somewhat cylindrical capsule with left basal hypopygial foramen (see Fig. 1); single strong curved epandrial seta positioned ventrobasally arising from lateral internal epandrial wall and not visible externally in lateral view; 2 epandrial lobes arising from apodeme near ventral margin of epandrium, adjacent, each with collar-like base bearing strong projecting bristle; hypandrium not fused to epandrium, but with membranous attachment, allowing it to be raised and lowered against epandrium; hypandrium arising far basad along ventral margin of epandrium, forming elongate cover over aedeagus, usually with flexion and accompanying ventral protuberance (usually paired and thorn-like) within distal ⅓, and sometimes with serrated or hair-like fringe at tip of hypandrium (Fig. 3); aedeagus elongate, arising from internal ejaculatory bulb near hypopygial foramen, curving basad to emerge under base of hypandrium, and extending almost to tips of surstyli, often with distinctive deep subapical notch on ventral margin; surstyli fused to epandrium without noticeable suture line, usually with dorsal and ventral arms bearing species-specific setae and projections; cercus with basal pilose section from which projects distolateral arm bearing long setae (Fig. 2).

FEMALE TERMINALIA (Figs 4,5): abdomen telescoped, with 5 visible segments concealing 4, often retracted segments of oviscapt; segments 6, 7, 8 smooth and polished, with fused terga and sterna, projecting collar-like from segment 5; 2 elongate internal rods adjoin fused segment 9+10; segment 9+10 with 2 pairs of dorsal peg-like projections or spines (possibly homologous to the acanthophorites of lower Brachycera); pair of cerci arise ventrolaterally from segment 9+10.

Bionomics. Adult *Corindia* are often found on the trunks of smooth-barked *Eucalyptus* and *Angophora* trees. Here they display a stance similar to that of *Medetera,* a vertical upright posture, with the body leaning outwards, such that the abdomen makes an angle with the surface. When disturbed, they run rapidly sideways or backwards, or fly a short distance to land laterally and somewhat higher about ¼ to ⅓ around the trunk's circumference, always maintaining the upright posture. I have observed individuals of *C. major* using these short flights to irregularly spiral up the boles of huge, smooth-barked eucalypts until out of sight. Some specimens were seen flying down parallel to the trunk to land near the base and thereby initiate another ascent.

Congregations of *Corindia* on tree trunks presumably function as leks to facilitate mating, as is the case with *Medetera* (Bickel, 1985). Males of *C. major* have been observed to approach females (and sometimes other males) from behind and attempt to copulate by thrusting their abdomens forward between their legs towards the terminalia of their prospective mates. Coupling has been observed in *Corindia* (either *C. major* or *C. cooloola),* the mated pair resting upright on the trunk of *Eucalyptus* sp., and with the male posterior to and partially covering the female. *Corindia* males lack prominent secondary sexual characters (except possibly the ventral cuticular projection on femur III of *C. trudis),* and mating display, common among more ornamented male dolichopodids, has not been observed.

Nothing is known of the immature stages of *Corindia.* However, I have observed a gravid female *C. minor* apparently ovipositing in bark fissures on a healthy black wattle, *Acacia* near *decurrens.* This suggests a possible subcortical habitat for the larvae, similar to that of many *Medetera.*

Corindia is apparently endemic to Australia, with a distribution along the southern and eastern coasts and ranges from South Australia and Tasmania, to Queensland, and across tropical northern Australia. Considering the far northern distribution of some *Corindia* species, including the Torres Strait Islands, the genus may extend into the Papuan region. However, I have not seen the genus in any collection of New Guinea dolichopodids, including the extensive Bishop Museum holdings.

Etymology. *Corindia* is derived from Corindi, a geographical place name of aboriginal origin on the New South Wales northern coast, and the gender is feminine.

Corindia major n. sp.

Type material. HOLOTYPE ♂; PARATYPES 10 ♂♂, 9 ♀♀: **New South Wales:** Corindi Creek, Red Rock, 15 km N of Woolgoolga, 7-xi-1980, on trunks *Eucalyptus propinqua,* coastal forest, *leg.* D.J. Bickel (Holotype, 4 paratypes, AMS; 15 paratypes, ANIC).

Additional material examined. New South Wales: Tahmoor, 18-ii-1981 (AMS); Mosman, Ashton Park, 12-ii-1984, 26-xii-1984, on trunks *Angophora costata* (AMS); Myall Lakes National Park, on *A. costata,* 21-xi-1985 (AMS); Putty Rd at Tinda Creek, 20 km N of Colo Heights, 17-ii-1984, on trunks *Eucalyptus haemastoma* (AMS); nr. Buladelah, 11-xii-1985, on *E. grandis (AMS).* **Queensland:** Cooloola National Park, on *Eucalyptus* sp., 27-xi-1985 (AMS). **Tasmania:** Melaleuca Inlet, SW Coast, 3-ii-1966 (MVM).

Unassociated females possibly representing this species: **Queensland:** 1 km N of Rounded Hill, 15°17′S 145°13′E, 5-x-1980, at light (ANIC); 3 km E of Mt Webb, 15°03′S 145°09′E, 1-x-1980, at light (ANIC); **Western Australia:** Millstream, 21-x-1970, at light (ANIC). (18 ♂♂, 26 ♀♀ specimens examined)

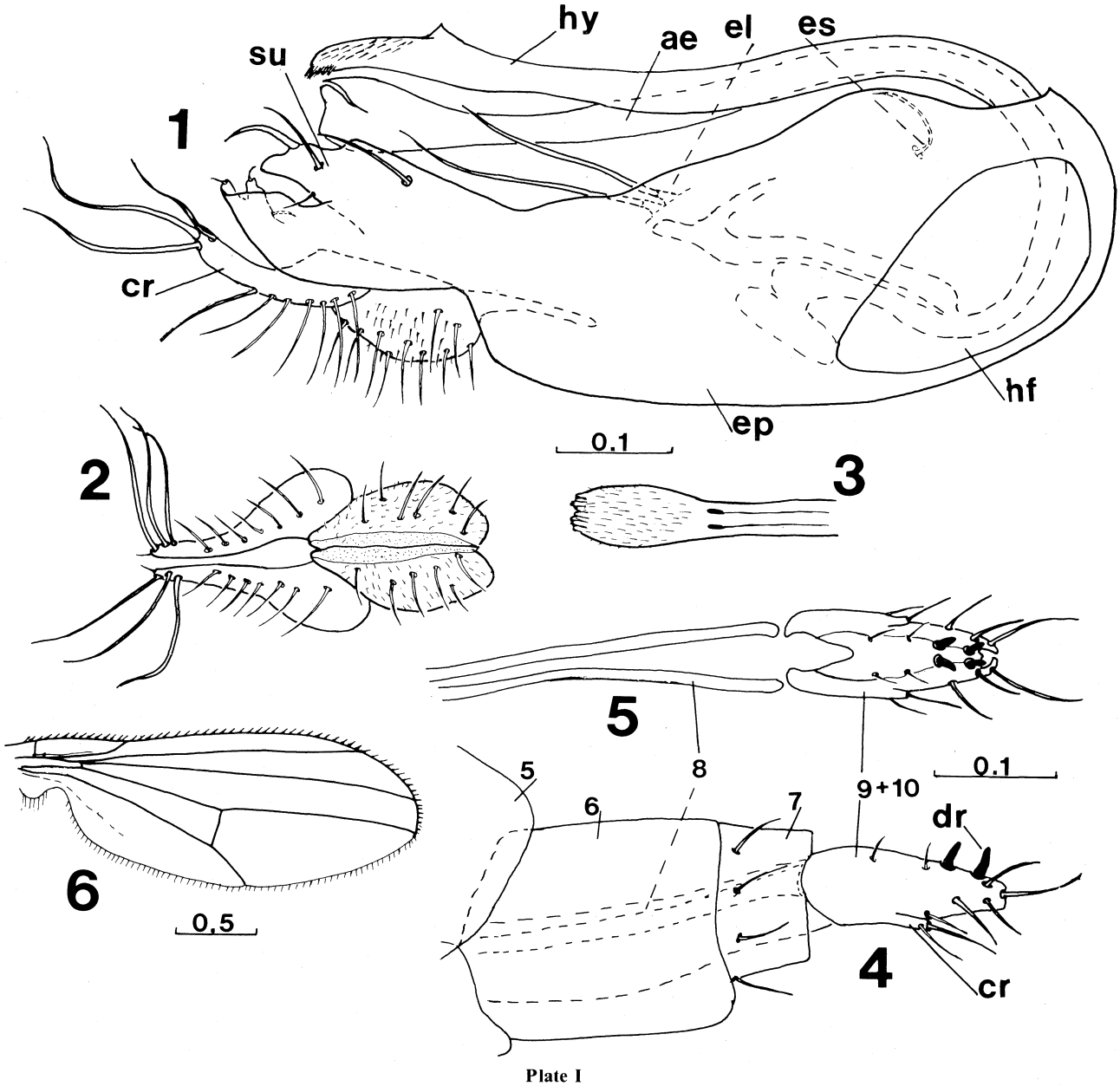

Plate I

Figs 1–6. *Corindia major,* Red Rock, NSW. **1,** Hypopygium, left lateral view: ae, aedeagus; cr, cercus; ep, epandrium; el, epandrial lobe; es, epandrial seta; hf, hypopygial foramen; hy, hypandrium; su, surstylus. **2,** Cerci, dorsal view. **3,** Apex of hypandrium, ventral view. **4,** Female terminalia, left lateral view. **5,** Female terminalia, dorsal view: cr, cercus; dr, dornen; 5, 6, 7, 8, 9+10, abdominal segments. **6,** Right wing, dorsal view.

Description. MALE: length 2.4–2.7.

HEAD: vertex, frons, metallic blue-green, covered with grey pruinosity; face satiny metallic blue-violet, with green reflections; clypeus metallic blue-green; palpi and proboscis dark brown; scape and pedicel orange-yellow, 1st flagellomere brown.

THORAX: metallic blue-green with dusting of grey pruinosity dorsally and laterally; margin of scutellum yellowish; setae brownish; 2–3 pale ppls; lateral scutellars ⅓ length of medians.

LEGS: coxa I pale yellow to infuscated brownish green in older specimens; coxae II and III brownish; legs otherwise yellow although femora sometimes infuscated; podomere ratios as I: 2.4; 1.8; 0.9/0.6/0.4/0.3/0.2. II: 2.4; 2.2; 1.2/0.7/0.5/0.3/0.2. III: 2.3; 2.8; 0.7/1.3/0.7/0.3/0.2.

WINGS: dimensions 1.9 x 0.8 (Fig. 6); CuAx ratio 0.7–0.9; lower calypter, halter pale yellow.

ABDOMEN: male abdomen entirely metallic bronze-green with pale setulae, covered with dusting of grey pruinosity; hypopygium (Fig. 1), epandrium elongate (compare with more spherical shape in other *Corindia);* hypandrium with paired ventral thorn-like projections at ⅚, and with apical fringe of 8 hair-like cuticular projections (Fig. 3); aedeagus expanded apically with deep ventroapical notch; surstyli broad in lateral view with dorsal and ventral lobate arms, bearing setae as figured; cerci with stout distolateral arms which bear distinctive long curved setae (Fig. 2).

FEMALE: similar to male except as noted.

ABDOMEN: terga 1, 2 and 3 almost entirely yellow except for some dorsal infuscation; some specimens with tergum 1 entirely metallic green, and in apparently older specimens, tergum 2 and part of tergum 3 may exhibit some green coloration dorsally and laterally; sterna 2–5 yellowish; in many specimens, tip of oviscapt is upcurved (Figs 4, 5).

Remarks. *Corindia major* is found along the eastern coast of Australia from southern Queensland to Tasmania, and is a relatively common species, especially in dry sclerophyll forests. Isolated female specimens from tropical Queensland and Western Australia which display yellowish abdominal terga and are in the approximate size range may represent this species.

Corindia collessi n. sp.

Type material. HOLOTYPE ♂; PARATYPES 4♂♂, 3♀♀: **Queensland:** Mt Cook National Park, 15°29′S 145°16′E, 10-v-1981, malaise trap, *leg.* D.H. Colless; PARATYPES 5♂♂: same data except 12-v-1981, taken at light; PARATYPES 3♂♂: **Western Australia:** Carson Escarpment, 14°49′S 126°49′E, 9 to 15-viii-1975, *leg.* I.F.B. Common & M.S. Upton (all ANIC).

Additional material examined. Two unassociated females possibly representing this species: **Northern Territory:** Caranbirini Waterhole, 33 km SW of Borroloola, 22-iv-1976, malaise trap. **Western Australia:** Millstream, 25-x-1970 (ANIC).

Description. MALE: length 2.2–2.4.

HEAD: vertex, frons metallic green with grey pruinosity; face metallic blue-green with faint longitudinal furrows and some grey pruinosity; clypeus metallic blue-green; palpi and prooscis dark brown; scape and pedicel reddish yellow, 1st flagellomere brown, subrectangular.

THORAX: metallic green with bronze reflections, with grey pruinosity; setae pale to brownish; 1 pale ppl; lateral scutellars about ¼ length of medians.

LEGS: coxae dark brown, becoming paler distally; femora black; femoral 'knees', tibiae and basal tarsomeres yellowish; distal tarsomeres black; podomere ratios as I: 2.8; 2.3; 1.1/0.7/0.4/0.3/0.3. II: 3.0; 2.7; 1.4/0.9/0.6/0.4/0.3. III: 2.9; 3.2; 0.7/1.3/0.8/0.4/0.3.

WINGS: dimensions 1.9 x 0.8; CuAx ratio: 0.7; lower calypter and halter pale yellow.

ABDOMEN: metallic bronze-green, with grey pruinosity and short pale setulae; hypopygium (Fig. 7) small in relation to preabdomen, especially as compared with *C. major;* epandrial lobes arising near ventral margin of epandrium; hypandrium broad (Fig. 8), with flexion and slight ventral projections at ⅚, apex slightly deflexed; aedeagus with strong dorsal triangular prominence, and with apical notch; ventral surstylar arm arising medially and partially covered by longer dorsal arm; dorsal surstylar arm narrowed and curved apically, with distinctive stout curved seta on ventral margin; other surstylar setae as figured; distolateral arm of cercus with 4–5 strong dorsal setae and with apical setae as figured.

FEMALE: similar to male; abdomen unicolorous metallic green.

Remarks. *Corindia collessi* is distributed across northern tropical Australia.

Corindia minor n.sp.

Type material. HOLOTYPE ♂; PARATYPES 6♂♂, 2♀♀: **New South Wales:** Mosman, Ashton Park, 12-ii-1984, on trunks *Angophora costata, leg.* D.J. Bickel (ANIC).

Additional material examined. New South Wales: Mosman, Ashton Park, on *A. costata,* 2-xii-1984 to 6-i-1985; Ku-ring-gai Chase National Park, on *A. costata,* 28-xii-1984; Port Hacking River, Royal National Park, subtropical rainforest, on trunks *Acacia* near *decurrens* and *Alphitonia excelsa,* 12-ii-1985. (15♂♂,18♀♀, AMS).

Description. MALE: length 1.7–2.0. Similar to *C. collessi* except as noted.

HEAD: face shining metallic blue-green.

THORAX: metallic blue-green; lateral scutellars as weak hairs.

LEGS: coxae brown, becoming yellowish distally; legs otherwise yellow; podomere ratios similar.

WINGS: dimensions 1.8 x 0.8; CuAx ratio: 0.7.

HYPOPYGIUM (Fig. 9): hypandrium pinched with ventral thorns at ⅔, and expanded, clavate apically; aedeagus strongly curved with deep ventroapical cleft; surstylus with distinctive curved dorsal arm, setae as figured; cercus with long projecting distolateral arm.

FEMALE: similar to male; abdominal terga 1–5

unicolorous metallic green.

Remarks. *Corindia minor* is commonly during the summer months in the Sydney district, and is found on the trunks of smooth-barked trees in habitats ranging from dry sclerophyll woodland to subtropical rainforest.

Corindia capricornis n. sp.

Type material. HOLOTYPE ♂; PARATYPES 3♂♂: **Queensland:** 1 km W of Cooktown, 15°28′S 145°15′E, 13-v-1981, malaise trap, leg. D.H. Colless; PARATYPES 2♂♂: same data except 10-v, 12-v. **Western Australia:** PARATYPE ♂: 8 km S of Cape Bertholet, 21-iv-1977; PARATYPE ♂: Crossing Pool, Millstream, 21-x-1970, at light (all ANIC).

Additional material examined. Two unassociated females probably representing this species: **Queensland:** Gap Creek, 5 km ESE of Mt Finnigan, 15°50′S 145°20′E, 13-v-1981; 3.5 km SW by S of Mt Baird, 15°10′S 145°20′E, 4-v-1981 (ANIC).

Description. MALE: length 1.6–1.7. Similar to *C. collessi* except as noted.

HEAD: vertex, frons metallic green with brown pruinosity; face metallic blue-green with faint longitudinal furrows.

THORAX: setae yellowish; strong median scutellars, laterals as tiny hairs.

LEGS: coxa I yellow, coxae II, III infuscated basally, yellowish distally; legs otherwise yellow, tarsi darkened apically; podomere ratios similar.

WINGS: dimensions 1.4 x 0.8; CuAx ratio: 1.1; lower calypters and halteres yellow.

ABDOMEN: hypopygium (Fig. 10); epandrial lobes arise near ventral margin of epandrium; hypandrium with paired ventral thorn-like projections at ⅝, and apical coarse serrations; aedeagus expanded distally, with deep apicoventral notch; ventral surstylar arm with setae as figured; dorsal surstylar arm tapering, fingerlike; distolateral cercal arm with 2–3 strong dorsobasal setae, bare mid-section, 1–2 strong dorsal subapical setae, and strong apical seta.

FEMALE: similar to male; abdomen unicolorous.

Remarks. *Corindia capricornis* is distributed across northern tropical Australia, and is broadly sympatric with *C. collessi.*

Corindia torresiana n. sp.

Type material. HOLOTYPE ♂: **Queensland:** Torres Strait, Banks Island, 3-vi-1969, sweeping grassy savannah, *leg.* A. Neboiss (MVM T-8076).

Description. MALE: length 2.0; similar to *C. collessi* except as noted.

THORAX: metallic blue-green with grey pruinosity; lateral scutellars as weak hairs, less than ¼ length of medians.

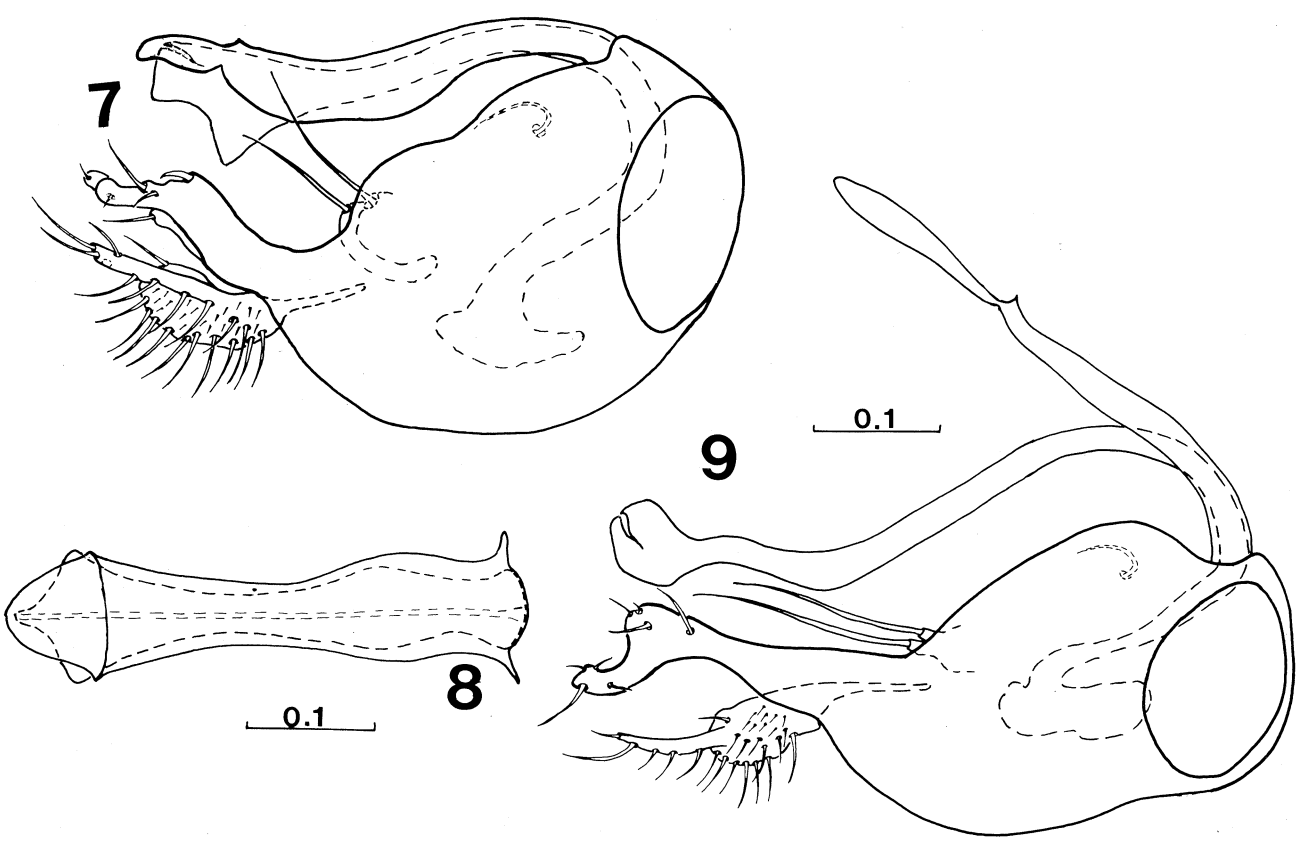

Plate II

Figs 7–8. *Corindia collessi,* Mt Cook, Qld. **7,** Hypopygium, left lateral view. **8,** Hypandrium and aedeagus, ventral view.
Fig. 9. *Corindia minor,* Mosman, NSW. Hypopygium, left lateral view.

LEGS: coxae dark brown, femora brown, legs otherwise yellowish; podomere ratios similar.

WINGS: dimensions 1.7 x 0.7; CuAx ratio: 0.8.

ABDOMEN: metallic green with short dark setulae; hypopygium as in Fig. 11; epandrial lobes arise internally, not visible in lateral view; hypandrium with ventral thorn-like projections at 5/6, and apical comb-like projections; aedeagus expanded distally, with deep apicoventral notch; dorsal surstylar arm blunt, with apex curved mediad; distolateral cercal arm with strong dorsal setae along entire length.

FEMALE: unknown.

Remarks. *Corindia torresiana* and *C. capricornis* are probably sister species.

Corindia cooloola n. sp.

Type material. HOLOTYPE, ♂; PARATYPES 1♂♂, 3♀♀: **Queensland:** Cooloola National Park, on trunks *Eucalyptus* sp., 27 to 28-xi-1985, *leg.* D.J. Bickel (AMS).

Description. MALE: length 1.5–1.6; similar to *C. collessi* except as noted.

HEAD: vertex and frons metallic green with brown pruinosity; face metallic blue-green.

THORAX: lateral scutellars reduced to tiny weak hairs.

LEGS: coxa I yellowish; coxae II and III brown basally but becoming paler distally; femora yellow to infuscated (femur III often brownish); remainder of legs yellow.

WINGS: dimensions 1.4 x 0.7.

ABDOMEN: hypopygium as in Fig. 16; hypandrium elongate, with flexion and sharp ventral protuberances at 5/6, and with coarse apical serrations; aedeagus expanded distally, with deep apicoventral notch; ventral surstylar arm with internal median pedunculate seta, and with apical setae as figured; dorsal surstylar arm elongate, bare and with curved apex; distolateral arm of cercus elongate, mostly bare but with some apical setae.

FEMALE: similar to male; abdomen unicolorous metallic green.

Remarks. *Corindia cooloola* is known only from the type locality in coastal south-eastern Queensland. This species is similar to *C. capricornis* and *C. torresiana* in hypopygial structure, and the three species appear to be closely related.

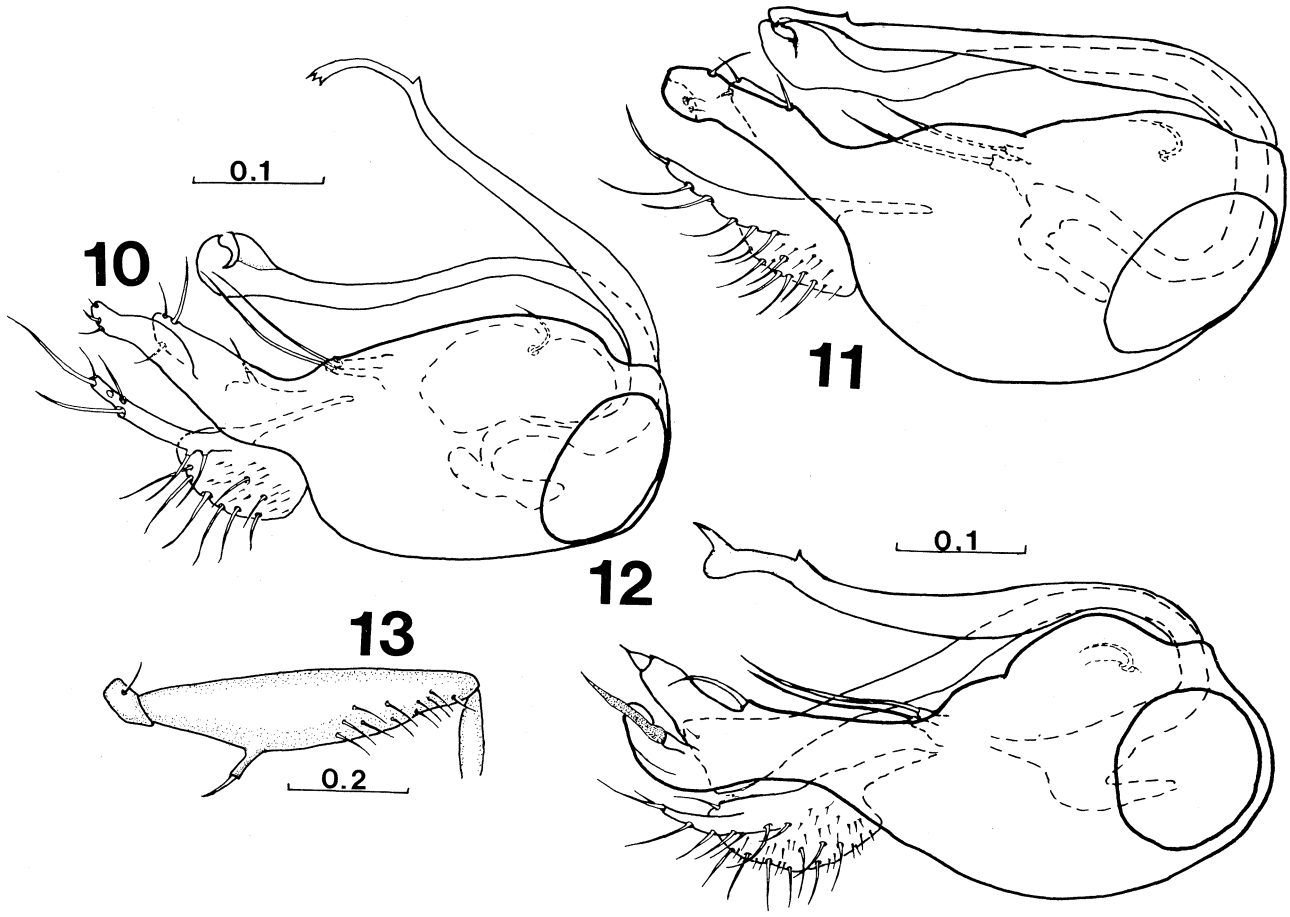

Plate III

Fig. 10. *Corindia capricornis,* Millstream, WA. Hypopygium, left lateral view.
Fig. 11. *Corindia torresiana,* Banks Island, Qld. Hypopygium, left lateral view.
Figs 12–13. *Corindia trudis,* Putty Rd., NSW. **12,** Hypopygium, left lateral. **13,** Male left leg III, anterior view.

Corindia nigricornis n. sp.

Type material. HOLOTYPE ♂; PARATYPES 9♂♂, 6♀♀: **New South Wales:** Myall Lakes National Park, on trunks *Angophora costata* and *Eucalyptus sp.*, 21-xi-1985, *leg.* D.J. Bickel (holotype AMS, paratypes AMS, ANIC).

Additional material examined. 2 ♂♂, 5♀♀: **Queensland:** Cooloola National Park, on *Eucalyptus* sp., 27-xi-1985 (AMS).

Description. MALE: length 1.9–2.0; similar to *C. collessi* except as noted.

HEAD: vertex, frons metallic green with grey-brown pruinosity; face shining metallic blue-violet with faint longitudinal furrows and some grey pruinosity; clypeus dark metallic green with brownish pruinosity; antenna entirely black.

THORAX: metallic blue-green with brownish pruinosity; setae yellowish; lateral scutellars about ¼ length of medians.

LEGS: coxae brownish basally, becoming yellowish distally; femora brown on basal ⅔; femoral 'knees' and remainder of legs yellow although tibia III infuscated on some specimens.

WINGS: dimensions 1.5 x 0.6; CuAx ratio: 0.6; M arches anteriorly somewhat, almost similar to M curvature in *Medetera;* lower calypter with yellow setae and halter pale yellow.

ABDOMEN: dark brown; hypopygium shining dark brown with yellowish cercus (Fig. 14); hypandrium trough-like and expanded subapically, but without flexion or ventral thorn-like projections; aedeagus with subapical notch; surstylus with distinctive subapical cuticular hook; distolateral arm of cercus relatively short, with some dorsal setae and with strong apical seta as figured.

FEMALE: similar to male except lateral areas of abdominal terga 2 often yellowish.

Remarks. *Corindia nigricornis* is distinguished by black antennae, absence of a hypandrial flexion, and a hook-shaped surstylar arm. This species is found in coastal dry sclerophyll forests from southern Queensland to central New South Wales. At Myall Lakes, loose groups of 3–4 individuals would tend to line up behind each other on the tree trunks. A number of the specimens have reddish legs and abdominal pleural membranes, possibly the result of feeding on tiny red mites (some *Medetera,* which have been observed to feed on red mites, develop a bright red haemolymph which is similarly visible beneath pale cuticle and membrane).

Corindia robensis n. sp.

Type material. HOLOTYPE ♂: **South Australia:** Little Dip Conservation Park, 10 km S of Robe, 31-i to 4-ii-1978, *leg.* P.J.M. Greenslade (SAM).

Description. MALE: length 1.5; similar to *C. collessi* except as noted.

HEAD: antenna entirely black.

LEGS: coxae brown; femora dark brown, but femoral 'knees' yellowish; tibia I yellow but tibiae II and III and tarsomeres brown.

WINGS: dimensions 1.3 x 0.6.

ABDOMEN: dark metallic green; hypopygium dark brown (Fig. 15); hypandrium elongate, with ventral thorn-like projections at ⅝; aedeagus with apical notch; surstylus with distinctive dorsoapical clavate projection, with ventroapical knob-like projection bearing long curved seta and strong hooked dorsal seta; distolateral arm of cercus elongate and bare except for apical setae as figured.

FEMALE: unknown.

Remarks. *C. robensis* is known only from the type locality in south-eastern South Australia.

Corindia trudis n.sp.

Type material. HOLOTYPE ♂: **New South Wales:** Putty Road at Tinda Creek, 20 km N of Colo Heights, 17-ii-1984, on trunk *Eucalyptus haemastoma, leg.* D.J. Bickel (AMS).

Description. MALE: length 1.8; similar to *C. collessi* except as noted.

HEAD: face metallic blue with green reflections; scape and pedicel brownish; 1st flagellomere black.

THORAX: setae black.

LEGS: entirely dark brown, femoral 'knees' somewhat paler; podomere ratios similar; femur III with dark ventral cuticular projection at ⅓, bearing a pale tapering seta (Fig. 13).

WINGS: dimensions 1.7 x 0.7; CuAx ratio: 0.6.

ABDOMEN: metallic bronze-green with short dark setulae; hypopygium as in Fig. 12; hypandrium in lateral view with sharp ventral thorns at ⅘, and with a pointed ventroapical projection; aedeagus expanded apically with deep ventroapical cleft; surstylus with two stout apical arms separated by V-shaped gap; striated blade-like seta on pedicel arises from gap; ventral surstylar arm capped by stout conical seta, and subtended along ventral margin by strong curved seta.

FEMALE: unknown.

Remarks. The specific name, *trudis,* from the Latin meaning a pointed pole or pike, refers to the ventral projection of femur III. This projection is probably a secondary sexual character found only in males.

Genus *Thrypticus* Gerstäcker

Thrypticus Gerstäcker, 1864: 43. Type species *Thrypticus smaragdinus* Gerstäcker, by monotypy.

Diagnosis. Body colouration usually bright metallic green; eyes with short hairs between facets; only 1 sa present; coxa III with 2 lateral setae; femur II with strong posterior subapical seta; veins R_{4+5} and M parallel to apex; CuAx ratio usually < 0.5, i.e., m-cu somewhat distant from posterior margin of wing; anal vein absent; hypandrium arising basoventrally from epandrium, and usually with a flexion or indentation in distal ⅓; hypopygial foramen left basolateral; aedeagus usually bifurcate apically; epandrial seta

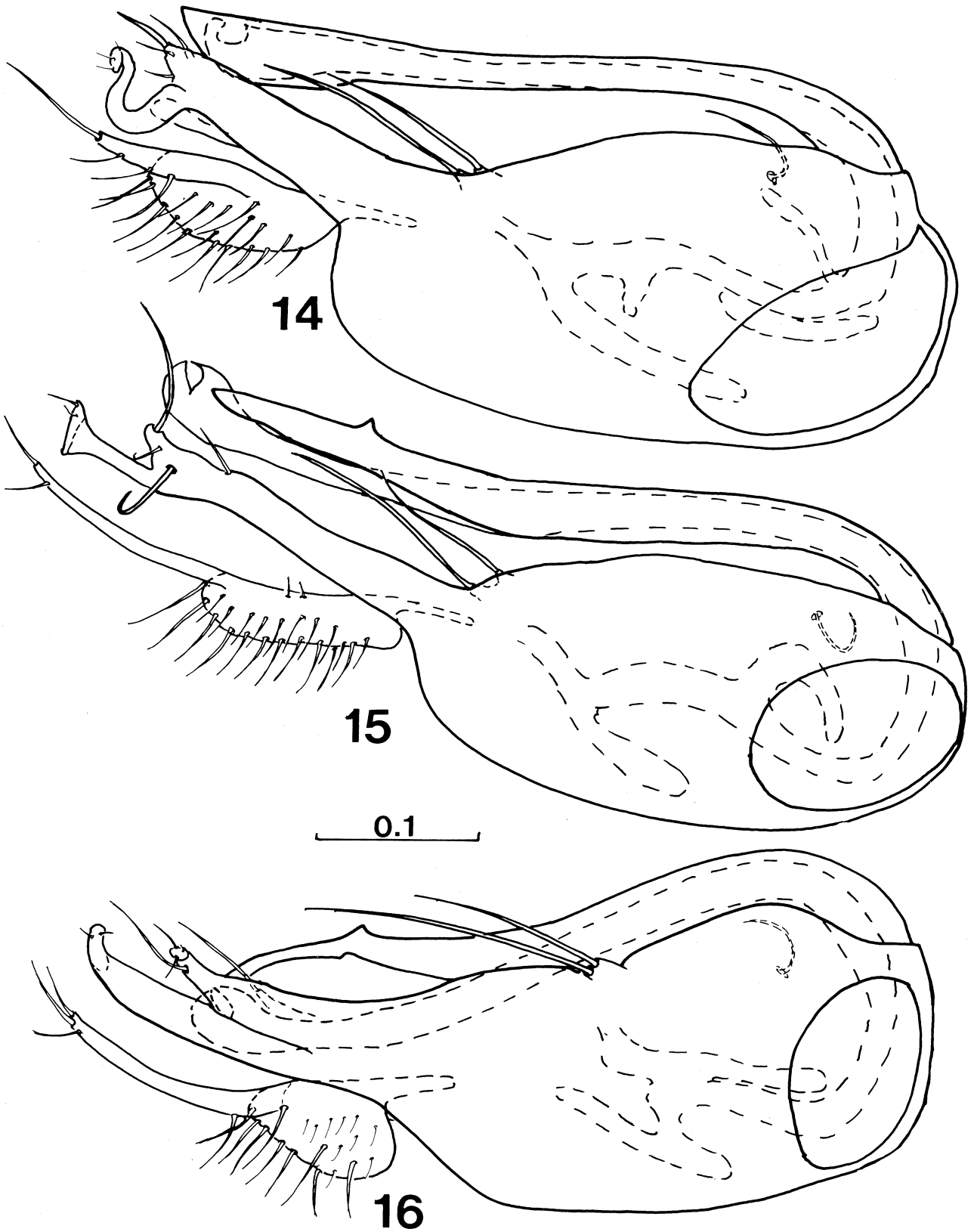

Plate IV

Fig. 14. *Corindia nigricornis,* Myall Lakes, NSW. Hypopygium, left lateral view.
Fig. 15. *Corindia robensis,* Robe, SA. Hypopygium, left lateral view.
Fig. 16. *Corindia cooloola,* Cooloola, Qld. Hypopygium, left lateral view.

strong, curved, internal, not visible in lateral view; epandrial lobes fused into elongate collar from which 2 bristles arise; surstylus strongly deflexed dorsad, usually lying conformably with similarly deflexed oblong-shaped cerci; cerci without distolateral arms; female oviscapt blade-like, sclerotized, narrow in dorsal view.

Remarks. *Thrypticus* is unique among the Dolichopodidae in that all known larvae are phytophagous stem-miners in the monocot families Cyperaceae, Gramininae and Juncaceae (Dyte, 1959). Females have a sclerotized, blade-like oviscapt (Figs 23, 24) designed for piercing and ovipositing within stems. The relatively small adults are generally taken in wet grassland or marsh habitat.

Thrypticus australis n. sp.

Type material. HOLOTYPE ♂; PARATYPES 9 ♂♂, 8 ♀♀: **Australian Capital Territory:** Black Mountain Reserve, 22-ii to 29-iii- 1968, I.B.F. Common (ANIC).

Additional material examined. Australian Capital Territory: Mt Majura, 2-iv-1963; Mt Coree, 13-iv-1968; Canberra, 7-x-1930, 22-ix-1930. **New South Wales:** 113 km W by S of Cobar, 10-xii-1982; Kincumber, SW of Terrigal, 8-xii-1976; 42 km NE of Deniliquin, 2-v-1978; Back Yama State Forest, 11-xi-1964; 20 km E of Forbes, in Callitris forest, 9-iv-1977; 55 km N of Mildura, 27-iii-1975; Ulladulla Beach, 1-x-1971; Lachlan River, 15 km SW of Euabalong, 28-xii-1976; The Rock, 14-ix-1968; 4.8 km S of Kiola, 3-x-1971; Fowlers Gap Reserve Stn, 31°05′S, 141°42′E, 29-xi to 2-xii-1981; Tumut Plains, 21-ix-1973; Ponds Creek, E of Armidale, 13-x-1962; Darling River, S of Bourke, 26-xii-1976; Colo Vale, 15-iii-1957 (USNM). **Norfolk Island:** Mt Bates, 300 m, 8-vi-1984. **Northern Territory:** 12 km SW of Alroy Downs, 10-iv-1976. **Queensland:** Boulier, 25 km NW by W of Birdsville, 8-iv-1976, at light; Lake Dynevor, 3-iii-1963, light trap. **South Australia:** Mungeranie Bore, 67.6 km N of Cooper's Creek, 17-ix-1972; Oratunga Creek, 11 km E of Parachilna, 4-x-1975; Germaine Gorge, 28-i-1959 (SAM); Muloorina Stn, 19-ii-1958 (SAM); Frome River Crossing of Cooper's Creek nr Marree, 26-x-1966 (SAM). **Tasmania:** Evandale, 1-iii-1967. **Victoria:** Lake Cullulleraine, 26-xii-1966; Cobran, 24-xii-1966; Glenelg River, 10-x-1962; Apollo Bay, 1-i-1967; 15 km S of Yarrora, 18-x-1983; Ovens River, E of Yarrawonga, 24-xii-1966; 13 km S of Pirita, 18-x-1983; Ouyen, 24-ii-1964 (MVM); Latrobe River Survey, Stn 10, 12, 20B, 24 to 31-x-1973 (MVM); 7 km SE of Hattah, 26-x-1966. **Western Australia:** Millstream, 10-iv-1971, 25-x-1970; Junana Rock, 26-x-1977, at light (female only). (217 specimens examined, all ANIC except where noted)

Description. MALE: length 1.3–1.4.

HEAD: vertex, frons, face dark metallic green with blue-violet reflections, and dusting of grey pruinosity; palpi and proboscis brown; antenna brown; scape short, with distal ring of setae; 1st flagellomere short, subrectangular, arista apical; dorsal postcranium strongly concave.

THORAX: bright metallic green with dusting of grey pruinosity dorsally, and with silvery pruinosity on pleura below notopleural suture; setae yellow; 5–6 pairs weak ac, about as long as width of ac band; 5 strong dc, decreasing anteriorly; 1 pa, only 1 sa, 1 hm, 1 pm, 1 sr, 2 npl present; only median scutellars present, laterals absent; 1 propleural present.

LEGS: setae pale yellow; coxae metallic green; trochanters yellow; femora dark green to ¾; femoral 'knees', tibiae, basal tarsomeres yellowish; distal tarsomeres darkened; coxa II with lateral bristle; coxa III with 2 lateral bristles; relative podomere ratio: I: 3.1; 3.0; 1.4/0.7/0.5/0.3/0.5. II: 3.2; 3.1; 1.5/1.0/0.6/0.5/0.5; femur II with strong posterior subapical; tibia II with 1 ad at ⅓ and strong ventral apical; III: 4.0; 4.0; 1.2/1.4/0.8/0.6/0.5.

WINGS: 1.3 x 0.5; R_4+_5 and M parallel to apex; m-cu at right angle to CuA; CuAx ratio: 0.4; lower calypter pale yellow, setae pale; halteres yellow.

ABDOMEN: bright metallic green with pale setulae, little pruinosity; abdominal terga 2–5 with 3–4 ovate depressions along lateral margins; relatively small sternum 8 covers left basal hypopygial foramen; hypopygium dark metallic green, appendages brownish (Fig. 17); epandrium pyriform, wide basally, narrowed distally, with dorsally deflexed lobate surstyli and conformably lying cerci; hypandrium arising basoventrally, with distinct flexion at about ⅔; hypandrium beyond flexion triangular, broad basally and tapering distally, heavily melanized (Fig. 18); aedeagus arising from base of epandrium, apically cleft; strong epandrial seta arising from lateral walls of genital chamber, not visible externally; epandrial lobes fused into elongate collar, bearing 2 strong bristles distally; surstylus lobate, distally melanized, with strong ventral seta at ⅔, and 2 short distal setae; cercus sparsely haired apical section.

FEMALE: similar to male except where noted.

HEAD: face slightly wider than male.

ABDOMEN: segment 7 (forming the oviscapt sheath) black, glabrous; oviscapt (Figs 23, 24) blade-like, distally dark brown with paler branched median tract, and with irregular margins as figured.

Remarks. Becker (1922:54) described *Thrypticus abditus* from a syntypic pair, a male from New South Wales (deposited at the Hungarian National Museum) and a female from Taiwan (deposited at Institut fur Pflanzenschutzforschung, Eberswalde-Finow, DDR). The male syntype has since been destroyed, thus the female alone carries the species name and is regarded as the lectotype. There can be little doubt that the male was a specimen of the widespread Australian species considered above. However, female *Thrypticus* rarely bear discernable species-specific characters which enable them to be accurately associated with males of their species, or to be distinguished from other female *Thrypticus* species. In fact, the association of males and females of varied species from the same locality is often problematical. Although some dolichopodid species do have wide ranges which encompass both Taiwan and Australia (e.g., *Medetera grisescens, Megistostylus longicornis),* and some *Thrypticus* species are widespread [e.g., *T. fraterculus,* in North and South

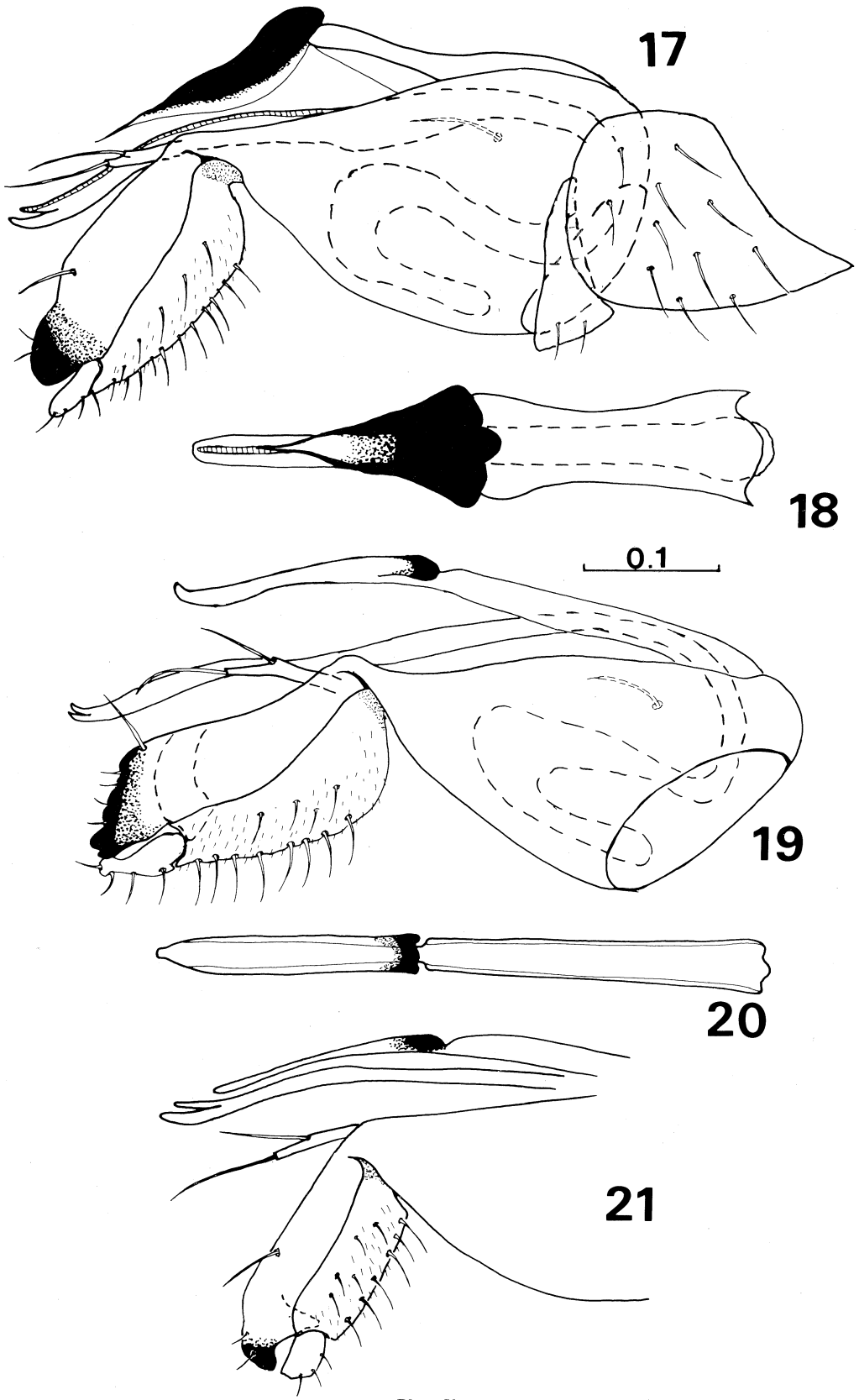

Plate V

Figs 17–18. *Thrypticus australis,* Black Mtn, ACT. **17,** Hypopygium, left lateral. **18,** Hypandrium and aedeagus, ventral view.
Figs 19–20. *Thrypticus tropicus,* near Mt Isa, Qld. **19,** Hypopygium, left lateral. **20,** Hypandrium, ventral view.
Fig. 21. *Thrypticus sumatranus,* Fort de Kock, Sumatra, paratype. Hypopygium, distal, left lateral view.

America and possibly Siberia (Robinson, 1975), *T. bellus* across Eurasia], the only evidence for *T. abditus* having an Indo-Australian distribution is an unjustified association of isolated specimens. I have been unable to locate any other museum specimens of Taiwanese *Thrypticus* to verify the distribution. Therefore, I have designated a new Australian species, *Thrypticus australis,* and regard *T. abditus* as an Oriental species.

Thrypticus australis occupies a broad zone across much of Australia and is also present on isolated Norfolk Island, more than 1400 km from the eastern Australian coast (see map, Fig. 25). It has been taken from such diverse habitats as coastal beaches, montane and subalpine woodland, and interior desert. It is one of the few dolichopodids found almost throughout the semiarid and arid interior. Although species of *Hydrophorus* and *Thinophilus* are usually taken near saline playa lakes, *Thrypticus australis* seems more or less associated with riverine habitats and probably is able to utilize its unique larval stem-mining habit to exploit the temporary abundance of grasses after rainfall. Although nothing is known of the immature stages of *T. australis,* its life history in the arid interior would make an interesting ecological study.

Apart from body size, intraspecific variation in *T. australis* includes a tendency for infuscated tibiae, especially tibia III, in specimens from Victoria and Tasmania, and a varying extent of melanization on the hypandrium.

Thrypticus tropicus n. sp.

Type material. HOLOTYPE ♂; PARATYPES 1 ♂, 1 ♀: **Queensland:** Big Mitchell Creek, Mareeba-Molloy Road, 4-v-1967, *leg.* D.H. Colless. PARATYPE 1 ♂: 66 km NW of Mt Isa, 9-iv-1976, at light (ANIC).

Description. MALE: length 1.3–1.4; wing 1.1 x 0.5; similar in almost all respects to *T. australis* except as noted: tibiae paler yellow; CuAx ratio: 0.45.

ABDOMEN: hypopygium as in Fig. 19; hypandrium beyond flexion parallel-sided, with only slight basal melanization (Fig. 20); epandrial lobes fused, with bristles as figured; aedeagus projecting to apex of surstylus; surstylus prolonged along dorsal side, distally melanized, with strong subapical ventral seta, 3–4 distal short setae, and median process projecting down towards cercus; cercus lying conformably with dorsal margin of surstylus, with distinct apical section bearing only 3 setae.

FEMALE: similar to female *T. australis.*

Remarks. *Thrypticus tropicus* is known from two localities in tropical northern Queensland.

Thrypticus fortescuensis n. sp.

Type material. HOLOTYPE ♂; PARATYPES 3 ♂♂: **Western Australia:** Millstream, 25-x-1970, *leg.* D.H. Colless (ANIC).

Description. MALE: length 1.4–1.5; wing: 1.2 x 0.5; similar in almost all respects to *T. australis* except as noted: body colour a darker blue-green in all specimens; CuAx ratio: 0.4.

ABDOMEN: hypopygium as in Fig. 22; hypandrium parallel-sided, similar to that of *T. tropicus* (Fig. 20); surstylus elongated, subequal in length to epandrium, aedeagus thus only extending ⅔ length surstylus, not reaching distal margin ; surstylus with strong ventral seta at ⅔, somewhat expanded, and strongly melanized distad, with 2–3 apical setae.

FEMALE: unknown.

Remarks. This species is known only from the type series taken along the Fortescue River, Western Australia.

Discussion

Of the three new Australian species described here, *Thrypticus australis* is the most distinctive, with its wide distal triangular-shaped hypandrium, while *T. tropicus* and *T. fortescuensis* are less readily separated and seem close to the Oriental *T. sumatranus* and a number of palearctic species. I have examined the types of *T. sumatranus* (Hollis, 1964:258; ZMUA) and have figured the distal hypopygium (Fig. 21). Only rather slight details of the surstylus seem to separate a number of Old World species (also see figures in Negrobov, 1971–77), and a possibility remains that some of these species might represent local variants of more widespread polytypic species.

Thrypticus is almost cosmopolitan in distribution, with 71 described species: 39 from the New World, 4 afrotropical, 23 palearctic, 2 Oriental, and 3 new Australian species. The genus seems to have radiated extensively in the neotropics (see Robinson, 1975). From examination of descriptions and genitalic figures (especially Negrobov, 1971–77; also Robinson, 1975, 1980), it is possible to define at least the palearctic species groups and place the Australian species within that context.

1. The *smaragdinus* group: this species group contains a single European species, *T. smaragdinus,* and although the type of the genus, it is rather unrepresentative. It has the following features: tapering hypandrium without flexion; aedeagus without apical cleft; abundant setae on surstyli; 3–4 pairs scutellars; oviscapt with ventral projection; face in both sexes very long; large body size, > 2.8 mm.

2. The *bellus* group: this species group includes 22 of the 23 palearctic *Thrypticus* species considered by Negrobov: *T. bellus, T. atomus, T. viridus, T. incanus, T. pollinosus, T. vestis, T. paludicola, T. intercedens, T. emilae, T. cuneatus, T. nigricauda, T. fennicus, T. divisus, T. laetus, T. altaicus, T. virescens, T. politus, T. tarsalis, T. pruinosus, T. tsacasi, T. riparus* and *T. tonus.* In addition, at least the nearctic *T. willistoni* and *T. fosteri,* the New World and possibly palearctic *T. fraterculus,* the oriental *T. sumatranus* and probably *T. abditus,* and the three new Australian species, *T. australis, T. fortescuensis* and *T. tropicus* belong here

as well. The *bellus* group is characterized by: hypandrium with distinct flexion or pinched area at about ⅔, with melananized thickening immediately distad; aedeagus with apical cleft; surstyli with only sparse distal setae; surstyli and cerci lying conformably together and usually strongly deflexed from long axis of epandrium; oviscapt without ventral projection; one pair of median scutellars present, the laterals as weak short hairs or lost; body length often < 2.0.

A number of other species groups await delimitation, especially in the New World.

The clear association of the Indonesian *T. sumatranus* and the three new Australian species with the principally holarctic *bellus* group suggests a northern origin for the Australasian *Thrypticus* fauna. Although I have seen no *Thrypticus* from New Guinea or the Melanesian archipelago, its presence there might be expected. *Thrypticus australis* at least has been able to reach Norfolk Island. A species of *Thrypticus* described from New Zealand belongs to a different genus (see Appendix) and probably *Thrypticus* is absent from New Zealand.

Phylogenetic Analysis

I have presented a cladistic analysis of the Medeterinae (Bickel, 1985) in which *Thrypticus* was regarded as derived from *Medetera*. However, study of *Corindia* has led me to alter these conclusions and following is a revised analysis. Also included in the analysis is the palearctic genus *Dolichophorus*.

The first 18 characters and their character states were

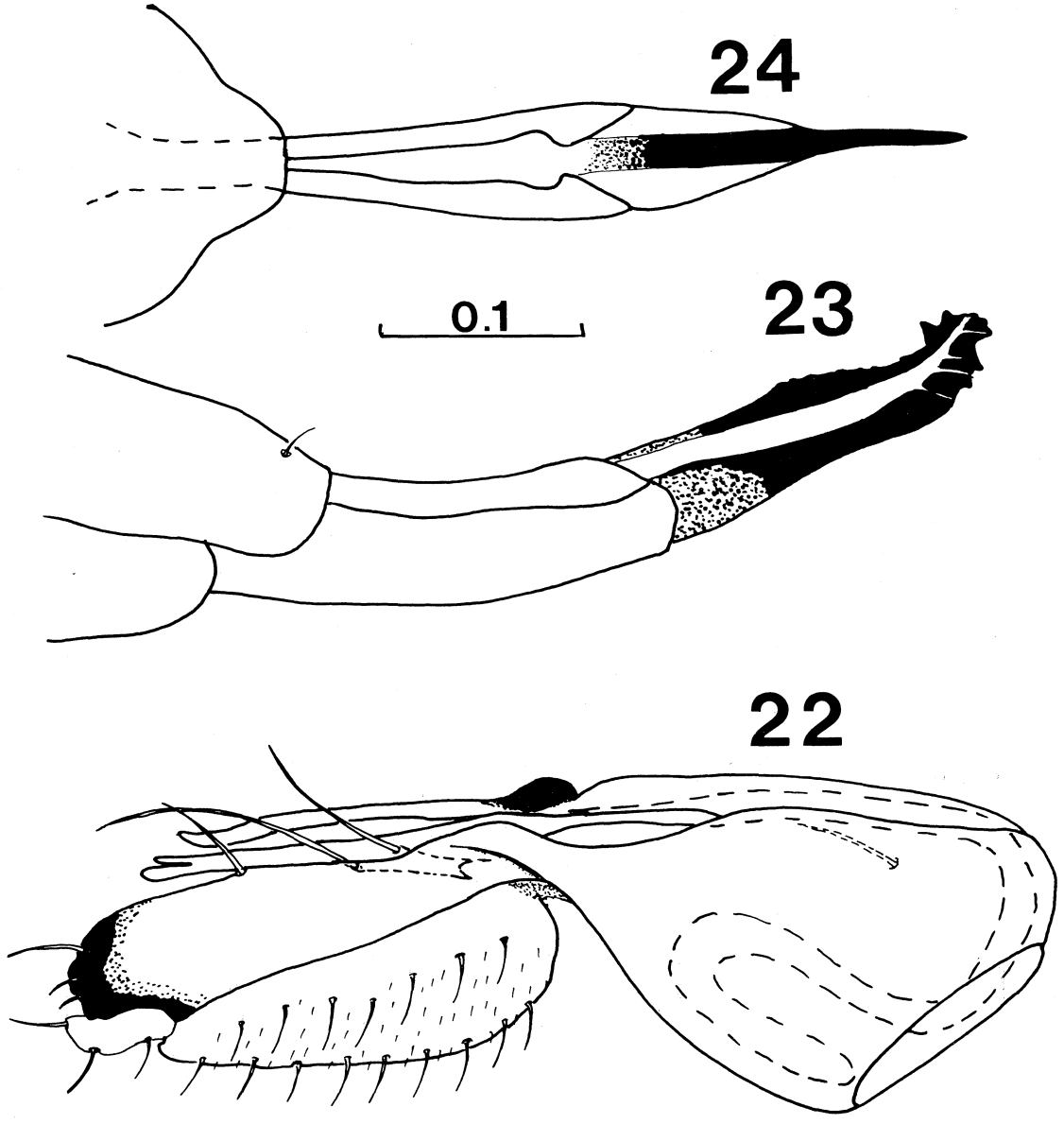

Plate VI

Fig. 22. *Thrypticus fortescuensis,* Millstream, WA. Hypopygium, left lateral view.
Figs 23–24. *Thrypticus australis, female terminalia:* **23,** left lateral view. **24,** Dorsal view.

discussed in Bickel (1985) and will be summarized in the following format — Character: plesiomorphic (ancestral) state/ apomorphic (derived) state.

1. Vestiture of eyes: short hairs present/ bare.
2. Postcranium: convex or flat dorsally/ concave dorsally.
3. Proboscis: weakly sclerotized/ massive, heavily sclerotized.
4. Lateral scutellars: strong bristles/ reduced to short hairs or lost.
5. Mesoscutal slope: convex/ flattened.
6. Anterior preapical femorals on II, III: present/ absent.
7. Strong anterolateral bristle on coxa I: absent/ present.
8. Coxa III lateral bristles: one/ two.
9. Male tarsus I: unmodified/ lobate tarsomeres.
10. Anal vein: present/ reduced or lost.
11. *Bosse alaire,* the flexion in vein M: present/ lost.
12. Hypopygium: encapsulated at tip of abdomen/ pedunculate.
13. Epandrial lobes: bases separate/ bases fused.
14. Attachment of surstyli to epandrium: suture line present/ fused with no suture evident.
15. Relative length of ventral and dorsal surstylar lobes: subequal/ dorsal lobe longer.
16. Cercus: undifferentiated/ with strong projecting distolateral arm.
17. Female oviscapt: broad, with dorsal dornen or setae/ narrow, blade-like, heavily sclerotized.
18. Larva: subcortical predators/ grass stem-miners.
19. Distal sectors of veins M and R_{4+5}: straight, subparallel to apex/ arched anteriorly, converging somewhat. I had previously considered that *Thrypticus* had undergone a character reversal to regain the plesiomorphic state from the apomorphic, *Medetera*-type venation. I no longer regard *Thrypticus* as derived from *Medetera,* and the venation of *Thrypticus* and *Corindia* should be regarded as plesiomorphic, similar to that of other dolichopodid subfamilies such as the Sympycninae and Diaphorinae.

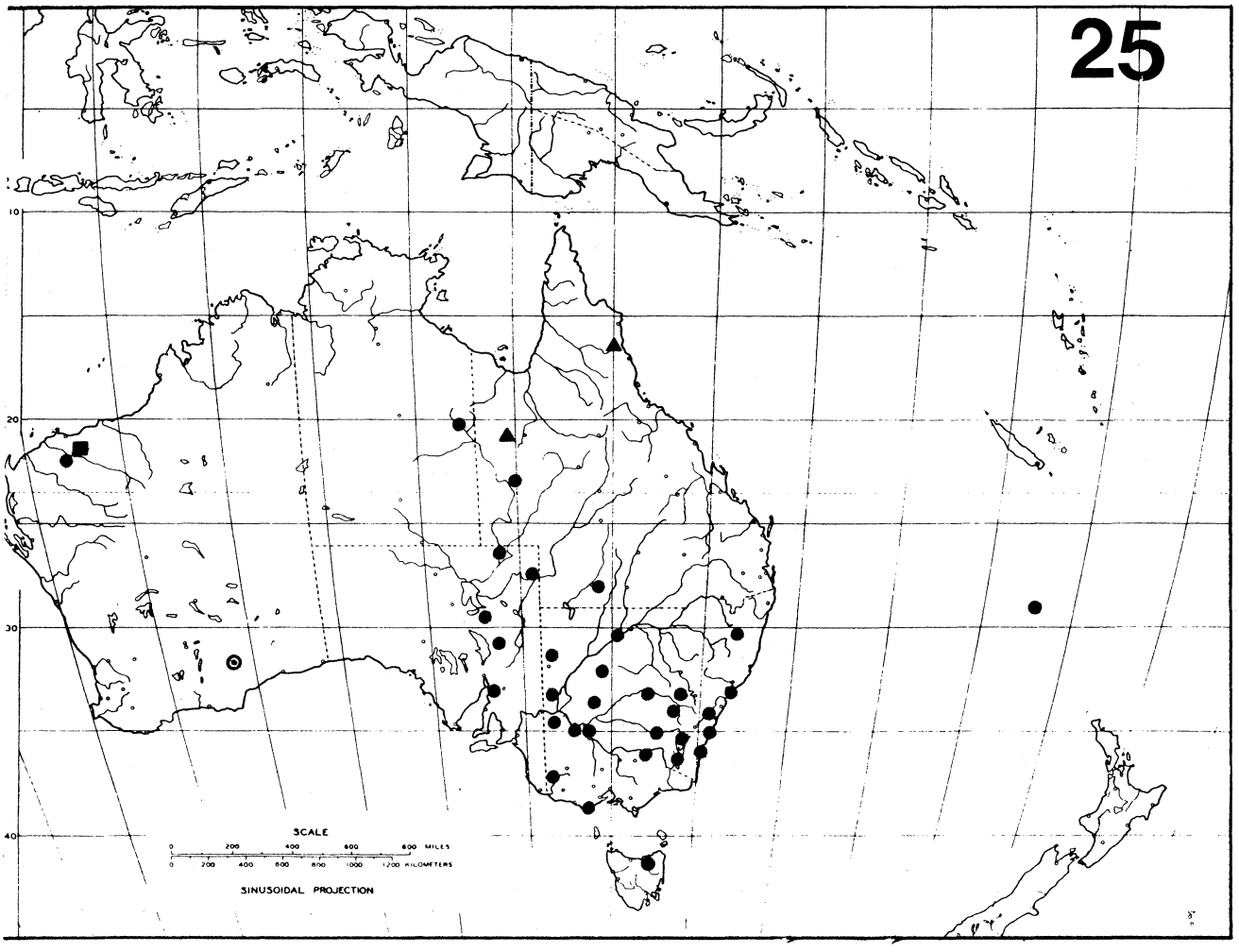

Plate VII

Fig. 25. Distribution Map of Australian *Thrypticus.*
● *T. australis*
⊙ *T. australis* (?), female only.
▲ *T. tropicus*
■ *T. fortescuensis*

20. Supraalar bristles (sa): two/ one, the anterior bristle lost. I regard 2 sa as part of the ground-plan for the Dolichopodidae. In most *Medetera,* 2 sa are present, although the anterior bristle is generally about ½ the size of the posterior. In *Corindia, Thrypticus, Dolichophorus,* and a few species of *Medetera,* the anterior bristle is lost; a derived state.

21. Femur II posterior subapical bristle: present/ absent. The presence of this bristle is regarded as part of the dolichopodid groundplan. This bristle is present in both *Corindia* and *Thrypticus,* but absent in *Medetera* and *Dolichophorus.*

22. Hypandrium, attachment to epandrium: basal/ mid-ventral. The hypandrium arises from the base of the epandrium in most Sympycninae and Diaphorinae and is tentatively regarded as the plesiomorphic condition. Expansion of the basal epandrium and/or distal migration of the hypandrium would therefore be regarded as derived. The derived state is seen here in *Medetera* and *Dolichophorus.*

23. Position of the hypopygial foramen: left basolateral/ left mid-dorsolateral. Similarily, the hypopygial foramen is distinctly basolateral in the Sympycninae and Diaphorinae and is regarded as the plesiomorphic condition. The distal migration of both the hypopygial foramen and the hypandrium-epandrium attachment

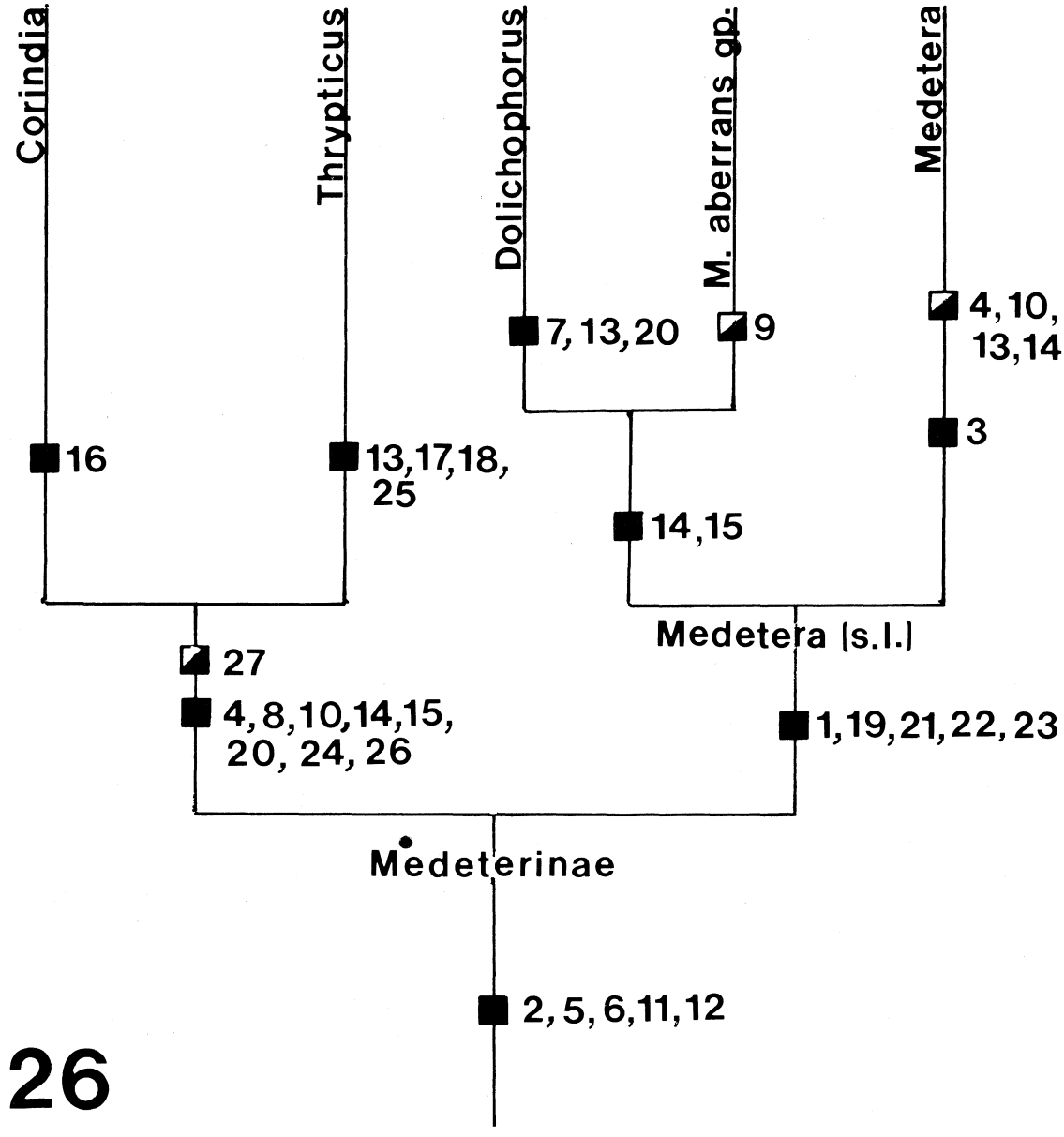

Plate VIII

Fig. 26. Cladogram of Medeterine Genera. Numbers refer to characters discussed in text.

■ Apomorphy

◪ Apomorphy shared by only some members of group.

(22) may be related phenomena, occurring simultaneously with hypopygial modification. *Medetera* and *Dolichophorus* display the derived condition.

24. Epandrial seta: straight, external, arising along ventral margin of epandrium, usually visible laterally/ curved, internal, arising from lateral wall of epandrial chamber. The derived condition is found in both *Corindia* and *Thrypticus.*

25. Position of cerci and surstyli: cerci free and not conforming to shape of surstyli/ cerci lying conformably along dorsal margin of surstyli. In *Thrypticus,* both the cerci and surstyli are distally deflexed and lie conformably together.

26. Apex of aedeagus: simple/ cleft, or notched. *Thrypticus* and *Corindia* both display the derived conditon; *Thrypticus* with a bifurcate cleft apex, *Corindia* with a deep apicoventral notch.

27. Flexion of hypandrium: absent/ present. Almost all *Corindia* and at least the *bellus* species group of *Thrypticus* have a distinct flexion or narrowed pinched portion in the distal third of the hypandrium. This is considered a derived character and is possibly a synapomorphy for the two genera with secondary loss in some *Thrypticus* species groups.

A cladogram representing the relationships of *Corindia, Thrypticus, Dolichophorus, Medetera* and the *Medetera 'aberrans* species group' is presented in Figure 26. *Corindia* + *Thrypticus* share strong synapomorphies 8, 24 and 26, and the somewhat weaker synapomorphies 4, 10, 15 and 20 which are homoplastic within *Medetera.* Derived character 27 may also be a synapomorphy for the *Corindia* + *Thrypticus* although it is not always developed in the two genera. *Thrypticus* is strongly defined by autapomorphies 13, 17, 18 and 25. *Corindia* is defined by autapomorphy 16, which also occurs in some *Medetera,* although perhaps not strictly homologous.

Medetera (s.l.) is defined by strong synapomorphies 1, 19, 21, 22 and 23. *Dolichophorus,* a palearctic genus of two species, is considered the sister taxon of the *Medetera 'aberrans* species group'. The phylogenetic relationships of *Medetera* are treated in greater detail in Bickel (1985) and in a revision of the Indo-Australian fauna currently in preparation.

Corindia and *Thrypticus* are regarded as having a sister group relationship. Both genera have a similar habitus and hypopygial morphology. Of the two genera, *Corindia* has a more generalized oviscapt, while *Thrypticus* has evolved into a new adaptive zone, with a highly specialized oviscapt designed for piercing the stems of grass-like monocots, where its larvae develop as phytophagous miners. *Thrypticus* probably evolved from a *Corindia*-like ancestor, although most certainly outside the Australian region. The apparent confinement of *Corindia* to Australia may reflect the relict distribution of a once more widespread taxon.

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Appendix

Parent (1933:361) described *Thrypticus nigrichaetus* from a single female taken at Otira, New Zealand. I have examined the holotype (NZAC) which has the head, left wing, and left legs I, II and III missing. The specimen is obviously not a *Thrypticus* since it bears the following features in contrast with typical *Thrypticus:* 2 sa, coxa III with only 1 lateral bristle, femora II and III with distinct anterior preapicals, and female oviscapt broad, with a crest of spines. I regard this specimen as a *Chrysotimus,* a genus well represented in the New Zealand fauna. Female *Thrypticus* and *Chrysotimus* might easily be confused while roughly sorting dolichopodids, but it is surprising that a worker as competent as Parent should have described the specimen as a *Thrypticus.* Therefore, *Thrypticus nigrichaetus* Parent should be regarded as *Chrysotimus nigrichaetus* (Parent) new combination.

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