

A new genus for G. V. Hudson's "curved case moth" (Lepidoptera: Psychidae)

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Abstract

Grypotheca new genus is proposed for a distinctive group of Psychidae in New Zealand with curved, tapering cylindrical cases. *Grypotheca pertinax* new species is the designated type-species, as all stages and both sexes are known. Other included species are *G. horningae* new species from The Snares (males, larvae only known), and *G. triangularis* Philpott, 1930 (males only known). The genus differs from other described Psychidae in New Zealand in case construction and larval structure, but until adults are definitely associated, the several species represented either by males or larvae in cases from litter samples of vegetation sweeping, including Hudson's illustrated example, are left undescribed.

Keywords: Lepidoptera, Psychidae, Psycheodinae, *Grypotheca*, Riccarton Bush, The Snares, Hump Ridge, new genus, new species, systematics, taxonomy.

INTRODUCTION

The object of this paper is to provide a name for the group of small bagmoths (Psychidae: Psycheodinae sensu Kozhanchikov 1956), first described by Hudson (1939, p. 474, pl. liv, f.27) as "an unknown case-bearing larva". Specimens from The Snares were described as gen. et. sp. indet (larvae and cases only) by Dugdale (1971, p. 143, f.153, 161, 162). Mr B. Patrick will be reporting biological observations on one of the included species, elsewhere in this issue.

Geographic symbols (MC, DN, etc.) refer to the area codes in Crosby et al. (1976). AMNZ = Auckland Institute and Museum, Auckland.

BMNH = British Museum (Natural History), Cromwell Rd, London SW7 5BD, England.

NZAC = New Zealand Arthropod Collection held at Entomology Division, DSIR, Auckland.

Family **Psychidae** sensu Kozhanchikov, 1956

Subfamily **Psycheodinae** sensu Kozhanchikov, 1956, pp. 124-129.

Genus *Grypotheca* new genus

(from Greek *grypos* = curved, *theca* = a case or bag; gender feminine)
= gen. indet. Dugdale, 1971: 143.

Adult: MALE: antennal segments 2-4x longer than wide, evenly setulose with setulae either not longer than segment diameter or 1.5 times segment diameter; clypeus distinct, maxillary palpi 1-segmented or obsolete, haustellum rudimentary or absent; labial palpi 3-segmented, drooping, longer than distance between antennal bases, but not longer than head width. Mesonotum slightly produced forward, hiding prothorax. Forelegs lacking a tibial strigil, mid-legs with apical spurs, hindlegs with median and apical spurs. Wings with vein M single in each discal cell; veins M_2 , M_3 stalked or arising from a common point on the cell; 4 or 5 R veins; chorda vestigial or absent. **MALE GENITALIA:** abdominal segment 8 with lateral coremata; sternite 8 emarginate caudally, complete or split in ventral midline. Uncus apex either widely emarginate (Fig. 9) or narrowly so with dorsal and ventral points (Fig. 12); valva with 3 processes,

the middle one bearing a small apical spur, or (one species) the middle process lacking (and the uncus apex widely emarginate, c.f. condition in *Reductoderces*, Dugdale 1971, p. 142, Fig. 146, 149).

FEMALE: with head enclosed in pupal sheath; mouthparts, antennae, and eyes rudimentary; body unscaled except for the long tuft on abdominal segment 7. Legs short, stout, lacking spurs, tarsi 2-segmented, claws stout. Abdomen with spiracles on segments 1-8, those on segments 1-7 functional. Sterigma on sternite 8, ostiole subapical on the elongate sternite; ductus seminalis short; ovipositor with a Y-shaped sternite; all apophyses long, slender (Fig. 19-21).

Larva. Case curved, evenly granular, truncate at apex, circular in cross-section, tapering from a wide oblique mouth. Larva stout, head capsule unicolorous; protarsus longer than tibia on all legs, smooth, slender, straight; metasternum halves large, sclerotised, anterior midline apices strongly produced between the coxae; anal shield with D2 setae on tubercles; anal proleg with 4 prominent posterior setae, paraprocts not developed.

TYPE-SPECIES: *Grypotheca pertinax* Dugdale, new species.

I have designated *G. pertinax* the type-species because it is the only one that is a) known for both sexes, and b) readily available, being abundant at its type locality.

INCLUDED SPECIES: *Grypotheca pertinax* Dugdale, **new species**; *Grypotheca horningae* Dugdale, **new species**; *Grypotheca triangularis* Philpott 1930, **new combination**.

In addition males from Whanganui Valley TO, Pouakai Range TK, North Egmont TK, Dun Mountain NN, Kaihoka Lakes NN, Lake Rotorua BR, Dunedin DN, and Mt Watkins DN, differ from *G. pertinax* in valval process shape or number, or mensis ventralis sclerotisation, or in subscaphium length, but material from each locality is either too scanty or there are no associated larvae or females to allow a detailed taxonomic analysis. Larvae and their distinctive cases, extracted from litter collections from many localities, likewise have no adults associated, but show the presence of the genus from The Snares and Stewart Island to North Cape, and on most outlying islands except the Chatham group. The somewhat aberrant Dunedin species found by Mr B. Patrick arrived too late for description, but on ♀ structure is in the *pertinax* group.

In addition, I examined a male *Mallobathra araneosa* Meyrick, under that name in Philpott's collection at NZAC, and collected at the same place (Ben Lomond) on the same date (25 November 1912) as the Philpott specimens numbered 1/3 and 3/3 respectively in Meyrick's collection, BMNH, being two of the three syntypes on which Meyrick based his description of *araneosa*. The NZAC male has 3 valval appendages and the uncus apex is widely emarginate, a combination characteristic of *Grypotheca*. As both Mr Patrick and I have found that in a locality several micropsychids are at least partially synchronous for male flight, and as Meyrick's syntypes from Ben Lomond have not been examined for genitalia, I cannot definitely assign Meyrick's *araneosa* to *Grypotheca*.

New Zealand has a psychid fauna dominated by Psycheodinae sensu Kozhanchikov, unlike that of North America (Davis 1964, 1975), and *Grypotheca* has the most specialised females of all New Zealand psycheodine genera, retaining the pupal head capsule. Male genitalia indicate that *Grypotheca* is related to *Reductoderces* and not to the *Scoriodyta* – *Rhathamictis* group which has 1) male genitalia superficially like *Opogona* in Tineidae, and 2), for *Scoriodyta*, larvae with elongate, sclerotised paraprocts. Adult ♂ *Grypotheca* species are distinguishable from *Reductoderces* by their short labial palpi.

Grypotheca larvae are also found by beating low shrubs or branches coated in bryophytes, or picking them from tree trunks. *G. horningae* has been observed feeding on "green haze" on *Hebe elliptica* trunks (D. S. Horning, pers. comm.), and at least one of the other species feeds on litter (H. P. McColl, pers. comm.).

Key to *Grypotheca* species

1. Male colour pattern pale grey; middle process of valva thumb-like; larva with prothoracic spiracle on pronotal shield, distant from posterior margin **2**
 - Male colour pattern purple-brown with marginal yellow patches; middle process of valva finger-like; larva with prothoracic spiracle marginal on pronotal shield **3**
2. *Mensis ventralis* U-shaped, i.e., sclerotised
 - a) middle process of valva longer than width of costal process Whanganui TO, Kaihoka NN males
 - b) middle process shorter Mt Watkins DN males
 - *Mensis ventralis* present as lateral plates
 - a) sacculus apex bluntly triangular ***G. pertinax***
 - b) sacculus apex evenly rounded Pouakai Range, and North Egmont TK males
Lake Rotoroa BR male
3. Wing fringes yellow, mesonotum yellow discally; middle process of valva swollen at apex, sinuous ***G. horningae***
 - Wing fringes brown, mesonotum brown discally; middle process of valva not swollen, sharply bent mesally ***G. triangularis***

***Grypotheca pertinax* new species** Figs 1, 3, 6, 8, 9, 13, 19-21, 22-24.

ADULT. MALE: Antenna pallid, clothed in pale grey scales, densely so basally; head and thorax with fawn-grey scales, patagia darker; forewing ground colour pale yellowish-grey sparsely dappled with darker grey with a prominent dark patch at the apex of the discal cell; costa basally dark-scaled, and with 4 marginal dark patches; termen-dorsum with 8 dark marginal patches, tornal angle not evident, fringes pale yellowish grey, hindwings pale grey; wing span 8.5-9.0 mm. Mouthparts agaleate (Fig. 3), labial palpi shorter than distance between eyes across frons. Forewing venation: R3 + 4 entirely fused, chorda absent. Genitalia (Fig. 9, 13): uncus-apex broad, truncate; valva with middle process thumb-like, apical spine minute; subscaphium present; aedeagus strongly tapered, half valval length; mensis ventralis as paired triangular sublateral plates, obsolete mesally.

FEMALE: Body (Fig. 19) nude except for a pallid "hairscale" tuft on sternite 7; tergites 2 and 3 eroded on anterior margin, sternite 8 elongate, smooth, with ostiole on apical quarter (Fig. 21); papillae anales triangular, with a ventral plate bifurcate at apex (Fig. 20).

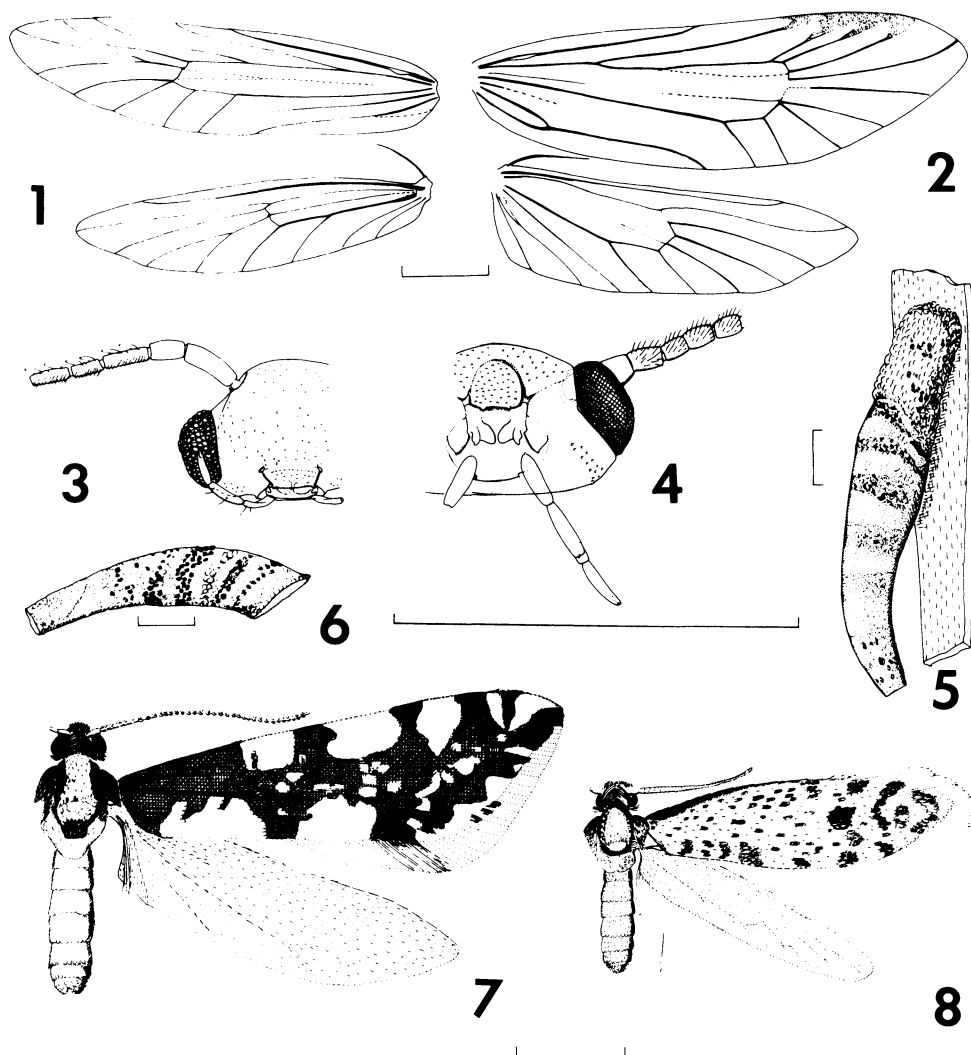
LARVA (Figs 22-24). Prothoracic spiracle on pronotal sclerite distant from posterior margin by twice spiracle diameter, and prothoracic setae XD1, D1 as far apart as are XD1/XD2 (Fig. 23), protarsi scarcely tapered, slender, 1.2x longer than tibia; (Fig. 22); abdominal segment 9 with SV 1 and V1 present, chaetotaxy of anal shield, anal proleg as in Fig. 24. Case (Fig. 6) slightly flared at mouth, finely granulate, length 4.0-4.5 mm.

TYPE LOCALITY: Riccarton Bush, Christchurch MC (latitude 43° 31' S, longitude 172° 30' E).

MATERIAL: **Holotype** male "New Zealand MC Riccarton Bush, 14-15 September 1982". J. S. Dugdale". **Paratypes:** 10 males, same locality, 1 with pupal case "on kahikatea trunks, 16 September 1982", JSD; 2, same locality, "September 1982", JSD; 7 same locality, 16 August 1983, B. Patrick; 7 paratype females, 1 same locality, site, "16 September 1982", JSD; 2 same locality, site, 11 July 1983, B. Patrick.

Holotype and 7 paratype males, 5 paratype females, NZAC; 3 paratype males, 2 paratype females, BMNH.

REMARKS: The species is known only from Riccarton Bush. The male *G. pertinax* is a fragile, morning-flying moth resting with the wings held roof-wise. It is distinguished from other species by its short middle valval process and grey, rather than brown and yellow, wing markings. Males resembling *G. pertinax* from other localities differ in valval shape or in mensis ventralis structure (Figs 10, Kaihoka Lakes NN; 11, Mount Watkins DN). There is clearly a series of populations closely similar



Figs 1-8. — 1. *Grypotheca pertinax* n. sp., fore and hindwing venation. 2. *G. horningae* n. sp., fore and hindwing venation. 3. *G. pertinax*, adult male head in face view. 4. *G. horningae*, adult male head in antero-ventral view. 5. *G. horningae*, larval case containing pupae. 6. *G. pertinax*, larval case (larva still developing). 7. *G. horningae*, adult male. 8. *G. pertinax*, adult male. Scales beside figures represent 1 mm.

to the Riccarton Bush population but records are too scanty for taxonomic analysis.

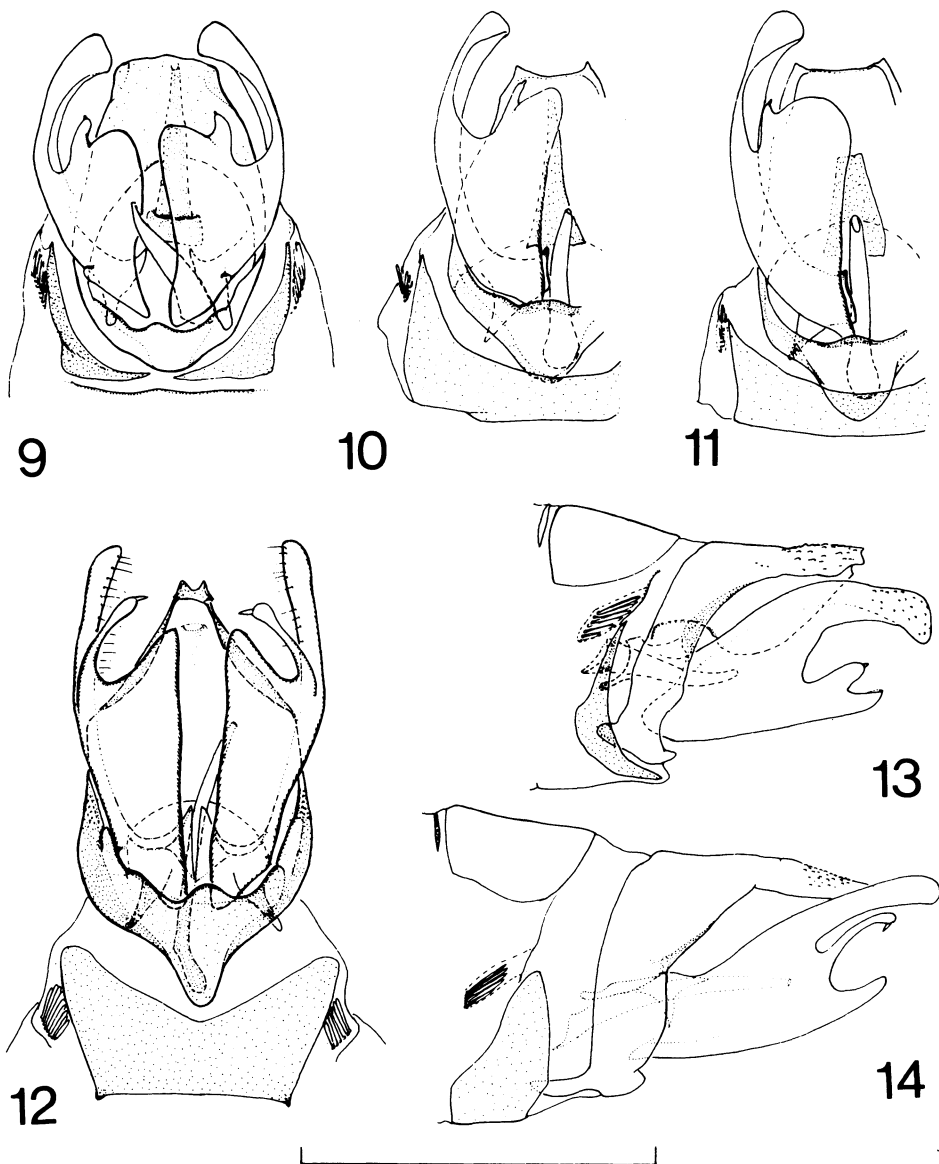
Biological information is given by Patrick (1986) in this issue. The name is derived from Latin, *pertinax* — stubborn.

***Grypotheca horningae* new species** Figs 2, 4, 5, 7, 12, 14, 25, 26

gen. et. sp. indet. Dugdale, 1971: 143, f.153, 161, 162 (larva, case)

"*Grypotheca horningae* Dugdale" nomen nudum, Best 1979: 482.

ADULT. MALE: Antenna pallid, banded with dark scales; head with brassy scales, mesonotum, patagia, and mesoscutum dark brown scaled, mesonotum yellow-scaled centrally; forewings shining purple-brown dappled with yellowish blotches, these coalesced along costa, termen, and dorsum, fringes yellow, hindwings dark grey. Wing span 9-11 mm. Mouthparts with galeae rudiments (Fig. 4), labial palpi longer than



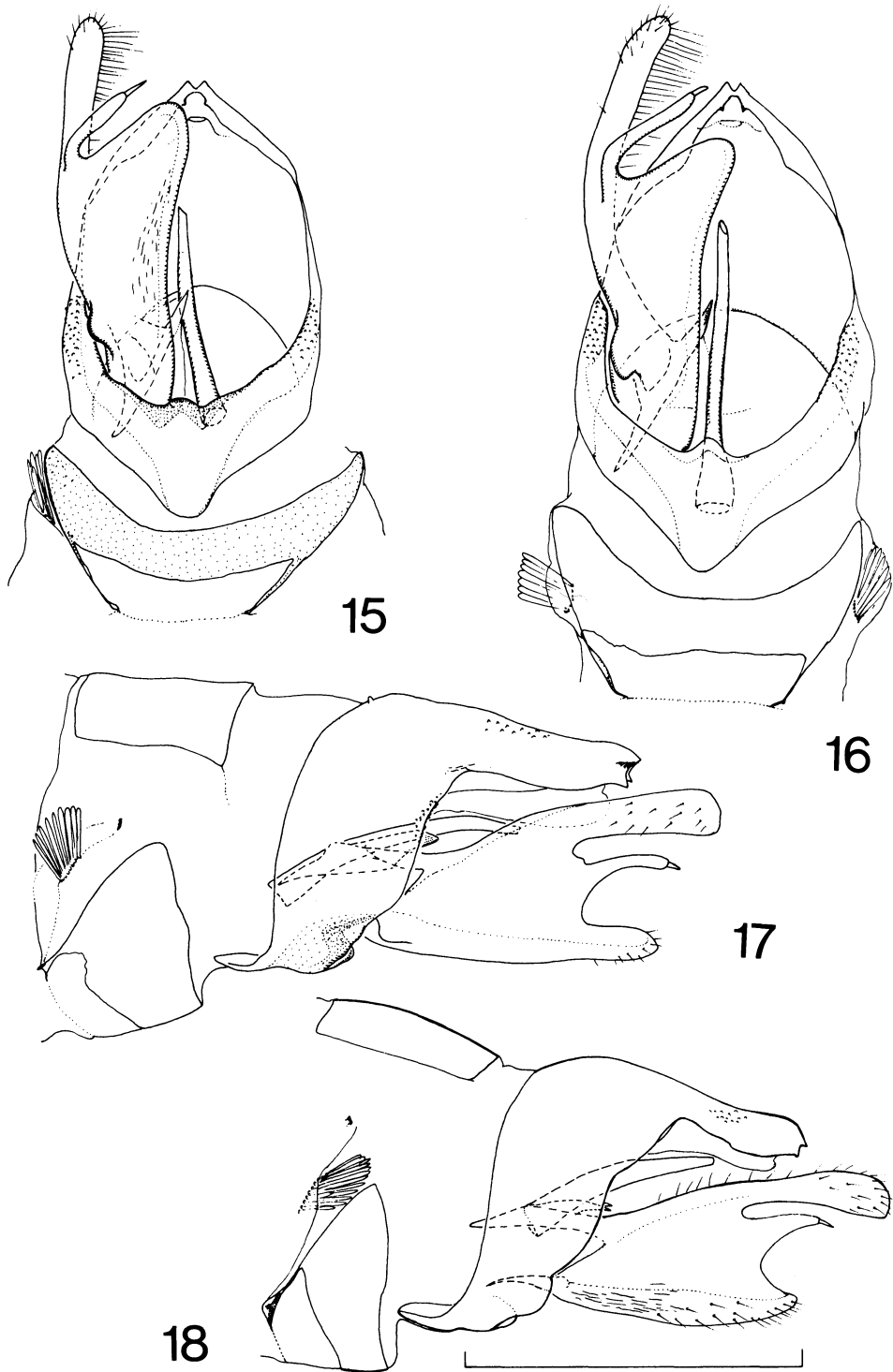
Figs 9-14. — Male genitalia. 9. *G. pertinax*, postero-ventral view. 10. *Grypothecha* sp., Kaihoka Lakes NN, ditto. 11. *Grypothecha* sp., Mount Watkins DN, ditto. 12. *G. horningae*, ditto. 13. *G. pertinax*, lateral view. 14. *G. horningae*, ditto. The scale represents 0.5 mm.

distance between eyes across frons. GENITALIA: uncus narrowly triangular, apex narrow, weakly bifurcate; valva with middle process finger-like, sinuous, over half as long as costal process, and with an apical spine; subscaphium absent; aedeagus nearly as long as valva; mensis ventralis a broad, emarginate plate.

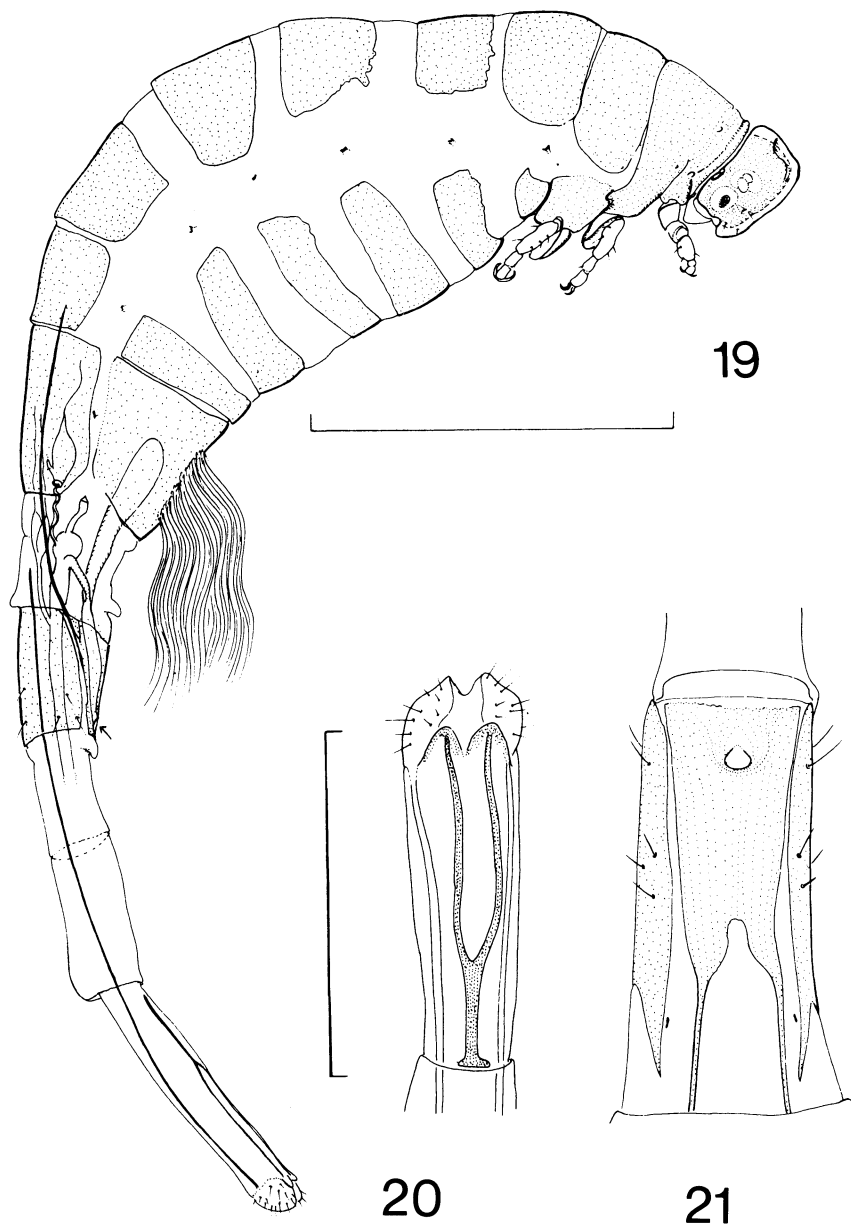
FEMALE: unknown.

LARVA (Figs 25, 26). Prothoracic spiracle on posterior margin of pronotum, pronotal setae XD1, D1 closer together than are XD1, XD2; protarsus tapered, 1.1-1.2x length of tibia; abdominal segment 9 lacking SV and V setae; anal shield and proleg chaetotaxy as in Fig. 26. Case slightly flared at mouth, length 4.5-5.2 mm.

TYPE LOCALITY: The Snares, (latitude 49°S, longitude 166° 35' E).



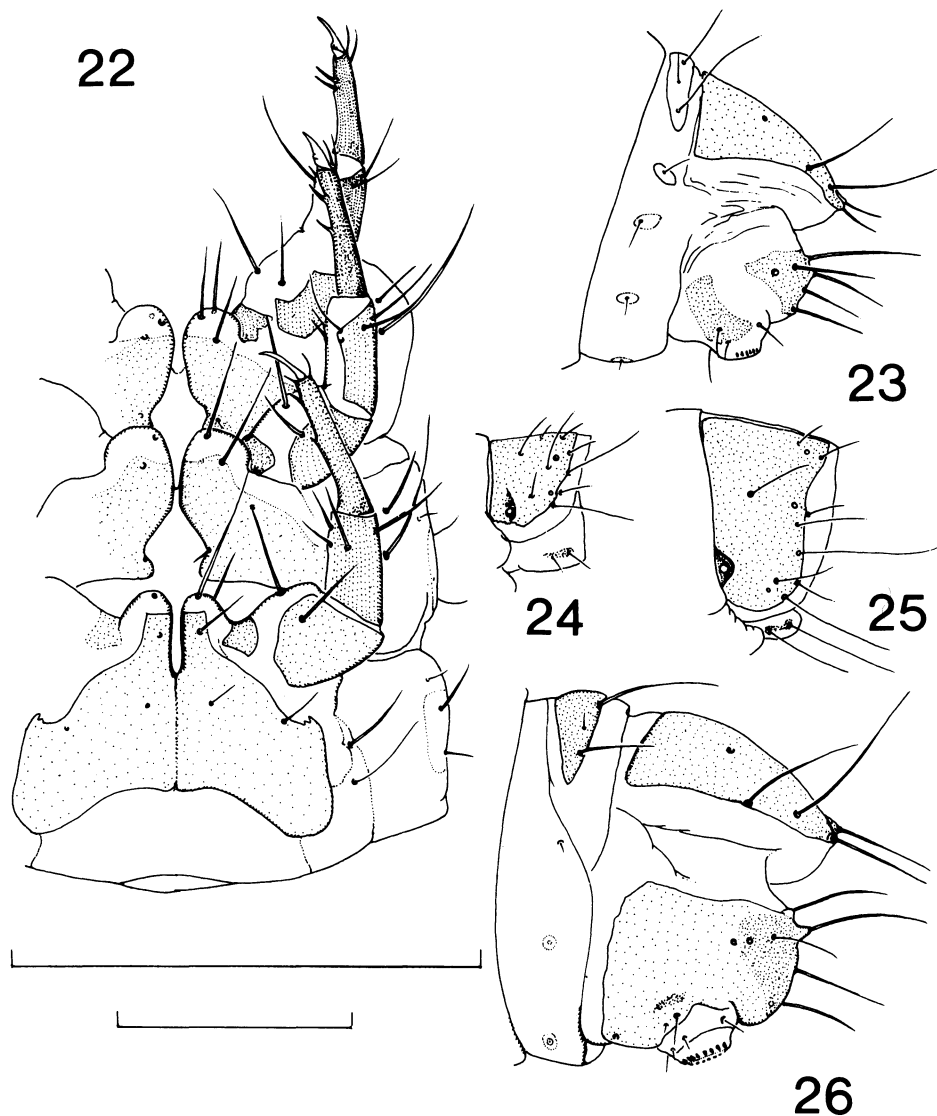
Figs 15-18. — Male genitalia, *G. triangularis* paratypes. 15. Waitati, posteroventral view. 16. Hump Ridge, ditto. 17. Hump Ridge, lateral view. 18. Waitati, ditto. The scale represents 0.5 mm.



Figs 19-21. — Female genitalia, *G. pertinax*. **19.** lateral view, with internal genitalia shown *in situ*. **20.** apex of ovipositor. **21.** sternite 8. The scale beside Fig. 19 represents 1 mm; beside Figs 20 and 21 0.5 mm.

TYPE MATERIAL: **Holotype** male "Penguin Creek Snares I. NZ. 26 November 72 C. J. Horning" NZAC
Paratypes: 106 males: 3 same data as holotype, 103 Punui Bay 13 November, 1 December, 2 December, 5 December, 6 December at dawn, D.S. Horning. Holotype male and 94 paratype males. NZAC; 6 paratype males, BMNH; 6 paratypes males, P. Hättenschwiler, Uster, Switzerland.

ADDITIONAL MATERIAL: 1 male pupa in case on *Hebe* trunk, Snares I. 27 January 71 (C.J.H.), 1 male Broughton I. 20 November 1972 on *Olearia* foliage (DSH), 173 larvae, Biological Station; S. W. Promontory; Lower Hut Biological Station; Penguin Creek; Sealers Cove, Sinkhole Flat; Skua point; Boat Harbour; Station Cove; Broughton I. (NZAC).



Figs 22-26.—Larvae, *Grypotheca*. **22.** *G. pertinax*, last instar larva, thoracic segments in ventral view. **23.** *G. pertinax*, abdominal segments 9-10, and anal proleg. **24.** *G. pertinax*, prothorax in lateral view, showing spiracle position. **25.** *G. horningae*, ditto. **26.** *G. horningae*, abdominal segments 9-10 and anal proleg. Upper scale (for Figs 22, 23, 26) and lower scale (for Figs 24, 25) represent 1 mm.

REMARKS: The species is known only from The Snares. The species is named after Carol J. Horning. Larvae were observed feeding on powdery green algae on *Hebe* trunks. While most cases could be easily dislodged, others were affixed to the bark over a small chamber. In these instances, a larval skin was found in the chamber, suggesting that the larva secures the case and carves out a “changing room” for each moult. Cases containing pupae (Fig. 5) are extended over a shallow pit.

Males fly for about 1 hour around dawn, ceasing to fly within 20 minutes after dawn (D. S. and C. J. Horning, pers. comm.).

G. horningae is distinguished from other *Grypotheca* species by its yellow-dappled forewing pattern and yellow wing fringes.

***Grypotheca triangularis* Philpott, new combination** Figs 15, 16, 17, 18*Talaeporia triangularis* Philpott, 1930:16; Hudson, 1939: 467-468, pl. lxi, f.5.

ADULT. MALE: Antenna pallid, banded with dark scales, segments about twice as long as wide; head and thorax clothed in brassy scales, with a yellow tuft in front of antennal scape; forewings purple-brown scaled, with 5 yellowish patches on both costal and termen margins, dorsum with a triangular yellow patch at half-length, and a smaller patch at the basal quarter; fringes dark grey, hindwings dark grey. Wingspan 13.0-13.5 mm (Hump Ridge); 12.0-13.0 (Waitati). GENITALIA: uncus broadly triangular, apex quadridentate, valva with middle process finger-like, bent sharply mesad, with a blunt apical thorn (Figs 16, 17, Hump Ridge FD) or a sharp thorn (Waitati DN, Figs 15, 18) subscaphium absent; aedeagus as long as saccular margin (Hump Ridge) or shorter (Waitati); mensis ventralis broadly U-shaped, basally emarginate.

FEMALE: unknown.

LARVA: unknown.

TYPE LOCALITY: Hump Ridge FD (latitude 46° 10'S, longitude 167° 15'E).

DISTRIBUTION: Hump Ridge FD and Waitati DN.

MATERIAL EXAMINED: Holotype male and 4 paratype males "Hump Mtn 2.1.22", 3 paratype males "Waitati 15.11.18" [C. E. Clarke], AMNZ.

REMARKS: *G. triangularis* is very similar to *G. horningae*, but differs in wing fringe colour, forewing pattern, mensis ventralis, tegumen-uncus, and valval process structure. The present material is too limited to judge whether the Hump Ridge and Waitati specimens represent two ends of a cline or are good species.

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The mysterious curved-case larva produces a new moth *Grypotheca pertinax* Dugdale (Lepidoptera: Psychidae)

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Abstract

Association of curved-case-bearing larvae with an adult moth is made. Notes on breeding, ecology, mating, and feeding requirements are also made. Two related species are also noted.

Keywords: Lepidoptera; Psychidae; breeding; ecology; mating flight; new genus; related species.