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A new subgenus with three new species of *Agrotis* from New Guinea (Lepidoptera: Noctuidae)

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Abstract
Following the examination of museum holdings and recently collected material of noctuid moths from New Guinea, the new subgenus *Papuagrotis* Vink & Zilli **subgen. n.** of *Agrotis* Ochsenheimer, 1816 is described. This is found to consist of at least three montane species new to science that are herein described also, namely *Agrotis* (*Papuagrotis*) *habbemae* Vink & Zilli **sp. n.**, *A.* (*P.*) *bintangus* Vink & Zilli **sp. n.** and *A.* (*P.*) *minutus* Vink & Zilli **sp. n.** Characters and relationships of the group with respect to other *Agrotis* s.l. are reviewed and briefly discussed.

Key words: New Guinea, moths, Noctuini, taxonomy.

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Introduction

During an expedition of the Papua Insect Foundation led in 2018 by Rob de Vos, Siep Sinnema and Jannie Sinnema-Bloemen in the area of Lake Habbema (New Guinea, Papua Region of Indonesia), a series of an unknown noctuid moth was collected. By features such as the spined tibiae, such species is obviously a member of Noctuinae Noctuini, and the fact that it shows numerous of the synapomorphies mentioned by San Blas (2015) for Agrotina undoubtedly places it within this subtribe. Among these are the biserrate (bipectinate) male antenna, the foretibia with spines on either side, an extra (irregular) row of spines on basal tarsomeres of mid- and hindleg, the abdomen without trifine brush organs, the sternum A8 with a subovate clearing at base, the uncus thickened at middle when seen from below, and the subscaphium consisting of two elongated sclerotised bands, to name just a few.

The discovery of this species prompted a search in the collections of Naturalis (Leiden) and Natural History Museum (London), known to host Papuan holdings of Noctuidae, to look for additional material of the same group. Specimens of another two unknown species clearly related to that from Lake Habbema could be found. In many respects, these three species match with the concept of *Agrotis* Ochsenheimer, 1816, although some of their features such as the uncus not uniformly curved ventrally, and the saccus with a dorsal notch do not even correspond to the circumscription of subtribe Agrotina itself proposed by San Blas (2015) after his morphological phylogenetic analysis. However, from the study of his paper, it seems evident that the characters stated to be synapomorphic at a higher level were not always unique and unreversed in the derived clades, being therefore in some cases groundplan synapomorphies for the recovered branches open to further changes or developments down the evolutionary lineages thus identified. For example, double or triple curved unci occur in *Feltia repleta* (Walker, 1857), *Agrotis rileyana* Morrison, 1874, *A. turatii* Standfuss, 1888, *A. simplonia* (Geyer, [1832]) and *A. obesa* Boisduval, 1829 (cf. Fibiger 1997; Lafontaine 2004). This circumstance and the fact that San Blas (2015) focused on the Neotropical species, whilst only a few taxa from other biogeographical regions were included, does not invalidate his phylogenetic hypothesis, but it weakens a diagnostic use of some of his characters. More effective are instead the synapomorphies assessed for less inclusive groupings such as *Agrotis* that re-

sult from his cladistic analysis (San Blas 2015: 160), though we could not recover some of them in our sample. Despite this, we prefer to describe the above species still in the genus *Agrotis*, albeit erecting for them a new subgenus, in the hope that the unusual features shown by them will prompt further insights into the phylogeny of *Agrotis* s.l. worldwide.

The diversification of lineages within *Agrotis* is in fact outstanding and is still in part unknown, especially when remote of uneasily accessible areas of the world such as the Papuan Highlands have not been thoroughly explored. This is further confirmed by other new species of *Agrotis* s.l. originating from that region that were either collected during the same expedition or were available in study from museum holdings that we examined for the present work. In fact, a review of the whole material from New Guinea referable to *Agrotis* s.l. that was accessible to us led to the identification of further new species of this genus from this island, that will be the object of future papers dedicated to the Noctuidae of New Guinea.

Material and methods

Standard protocols as recently detailed by Zilli & László (2022) for preparation, dissection and photographing of Lepidoptera were followed.

Abbreviations
KSP – Koleksi Serangga Papua, Department of Biology, Universitas Cenderawasih, Waena, Papua, Indonesia
n = number of specimens
NHMUK – Natural History Museum, London, United Kingdom
RMNH – Naturalis Biodiversity Center, Leiden, The Netherlands
x = average

Taxonomic part

Agrotis Ochsenheimer, 1816
Papuagrotis Vink & Zilli **subgen. n.** (Figs 1–29)

Type species: *Agrotis* (*Papuagrotis*) *habbemae* Vink & Zilli sp. n. (described below), by present designation.

Diagnosis

Frons bulged, without protuberance, foretibia with complete row of spines on inner side and variable number of spines along outer one; male genitalia with valve much tapered beyond sacculus, slightly sinuous and convex at middle of costa, cucullus neither dilated nor securiform but narrowly lanceolate and with very short corona, clasper ("ampulla" sensu San Blas, 2014, 2015) often wide till apex, anterior belt binding valva to diaphragma ("transtilla" sensu San Blas, 2015) long and sigmoid, uncus at least double bent; female genitalia with bisaccate bursa copulatrix divided into appendix and corpus bursae much uneven in length, the former positioned to the right, looping and 2.0-3.0 times longer that the latter (positioned to the left), and with distinctly preapical origin of ductus seminalis, the corpus compact saccate, gonapophyses rod-like, with no or minimally dilated tips, apophyses anteriores very short, ovipositor short, with short, setose papillae anales much wider than long in side view, and with slightly concave distal edge.

Description

Male (Figs 1–5, 7–9, 10)

Head. Comparatively small, frons uniformly convex, vertex with long rough scaling, eye globular, antenna with scape covered of long rough scales, flagellomeres except terminal ones bipectinate, with fasciculate cilia, labial palpus slender, roughly and long-scaled along the ventral margin of articles 1-2, with second article upturned and slightly incrassate distally, and third article small barrel-like, not overpassing the eye's dorsal profile, proboscis well developed.

Thorax. Patagium, tegula and notum with rough vestiture of long hair-like, sometimes bifid scales, and without middorsal crests. Forewing broad, with generally well distinct stigmata often filled with white, claviform long and narrow, thick edged black. Hindwing fuscous. Underside of thorax long-haired, that of wings with weakly expressed pattern except for distinct discal spot and postmedial line of hindwing. Legs slender, with long hairs especially on protibia, mesotibia and mesofemur, and metatibia.

Abdomen. Sub-cylindrical, smoothly scaled except caudally. Counter-tympanal bullae long and broad. Terga A3-A6 wide rectangular, terga A7-A8 trapezoidal, anterior sclerotised rims continuous on A2-A3, mesially interrupted on A4-A7, sternum A1+2 broad, A3-A7 weakly sclerotised, A8 with subovate clearing at base.

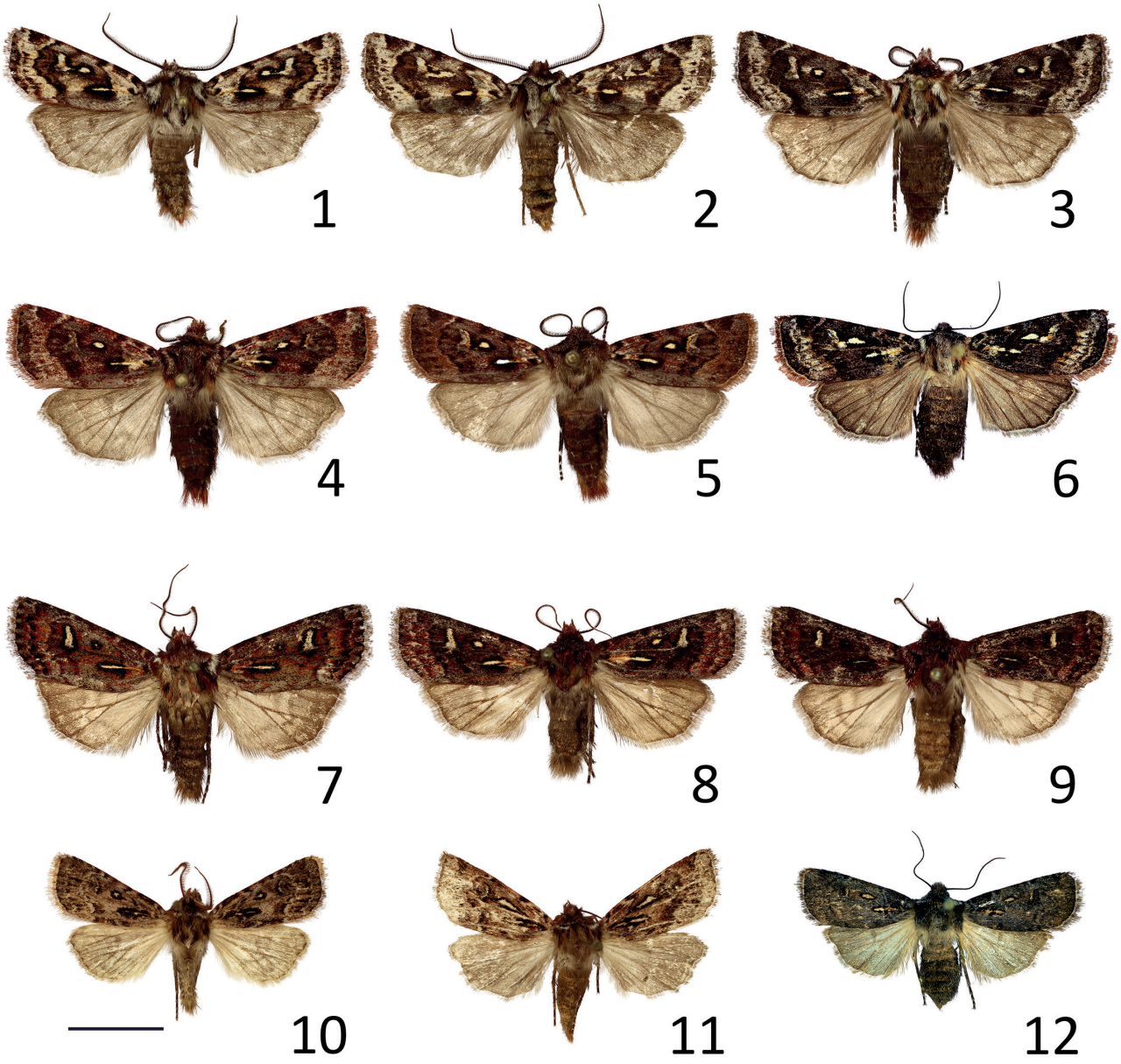
Male genitalia (Figs 13–26). Tegumen narrow, broadly excised dorsally, U-shaped, vinculum with thin and robust lateral arms that join ventrally into stout saccus. Valva slender, with short sacculus, clavus vestigial, reduced to microscopic papilla or entirely reduced, clasper flat and of approximately uniform width up to apex, cucullus slender blade-like, with incomplete corona. Uncus downcurved at base then upcurved. Juxta with ventral triangular expansion; manica penis lightly sclerotised. Phallus weakly sclerotized, especially at base, vesica with compact basal corpus and distal tube, and long and narrow sclerotised bar. Tuba analis with large paired subscaphium plates at base.

Female (Figs 6, 11–12)

Habitus. As in male, except for antenna, entirely filiform and shortly ciliate, and shorter apical tufting of the abdomen.

Female genitalia (Figs 27–29). Segment A8 in shape of frustum of cone, membranous midventrally, ostium bursae a simple slit, ductus bursae membranous and of uniform width, corpus bursae compact and saccate, appendix bursae coiled and much longer than corpus, distally saccate, with distinctly preapical origin of ductus seminalis, apophyses anteriores short rod-like, strongly sclerotised. Ovipositor very short, papillae anales almost trapezoidal in lateral view, of very short height, apophyses posteriores very thin rod-like.

Etymology. The name of the new subgenus derives from the combination of "Papua", stressing the provenance of the group from the Papuan region, with "*Agrotis*", the genus within which the subgenus is placed. Despite the fact that Ochsenheimer (1816) clearly coined some feminine names for the new species he was placing in his new genus *Agrotis*, the Greek "αγρότης" (agrótis), meaning



Figs 1–12 – Adults of *Agrotis (Papuagrotis)* **subgen. n.: 1–6,** *A. (P.) habbemae* sp. n., surr. Lorentz Reserve, Lake Habbema (1, holotypus ♂; 2–5, ♂ paratypi; 6, ♀ paratypus) (1–3, ♂ grey form; 4–5, ♂ brown form); **7–9**, *A. (P.) bintangus* sp. n., Star Mountains, 'Bivak 42' (7, holotypus ♂; 8–9, ♂ paratypi); **10–11**, *A. (P.) minutus* sp. n., Mt Giluwe (10, holotypus ♂; 11, ♀ paratypus); **12**, *Agrotis (Papuagrotis)* sp., ♀, Indonesia, Papua, surr. Lorentz Reserve, Lake Habbema. Scale bar = 1 cm.

"farmer, countryman", is clearly masculine, the feminine counterpart being in fact "αγρότισσα" (agrótissa). We thus consider both *Agrotis* and the new subgeneric name to be masculine.

Distribution. The subgenus appears to be restricted to mountain areas of New Guinea.

Remarks. It is worth noting that by some features such as the double or triple bent uncus and the short "quadrangular" ovipositor, members of the new subgenus seem to be closest to the *Agrotis cinerea* species-group (cf. Fibiger, 1997), a set of predominantly orophilous species occurring in the Western-Central Palaearctic (Fibiger, 1990). Holloway (1989) had also envisaged a possible relationship between the Bornean endemic *Agrotis kinabaluensis* Holloway, 1976 and *A. cinerea* ([Denis & Schiffermüller], 1775). These circumstances will therefore require further insights to assess if they are due to homoplasy or reveal some ancient evolutionary and biogeographic connections between species of *Agrotis* from such distant areas.

Agrotis* (*Papuagrotis*) *habbemae Vink & Zilli **sp. n.**
(Figs 1–6, 13–16, 20–23, 27)

Diagnosis

Species of *Agrotis (Papuagrotis)* closely similar to *A. (P.) bintangus* sp. n. (described below) from which it can be easily distinguished by the longer rami of the male antenna, the more bowed postmedial line of forewing beyond the reniform stigma, the orbicular and reniform stigmata nearer to each other, and the more sinuous uncus with slightly dilated and abruptly truncate tip that terminates into a triangular face. For the distinction from *A. (P.) minutus* sp. n. (described below) see under this species.

Description

Male (Figs 1–5)

Size and colouration. Wingspan 34-39 mm (x = 36.33 mm; n = 9). Colouration of head, thorax and ground colour of forewing very variable, from dark reddish brown to pale ash grey, variously mottled with different hues of darker brown or grey and with scattered white scales.

Head. As in subgeneric description, with antennal rami comparatively long, the flagellum being filiform only in its distal fourth.

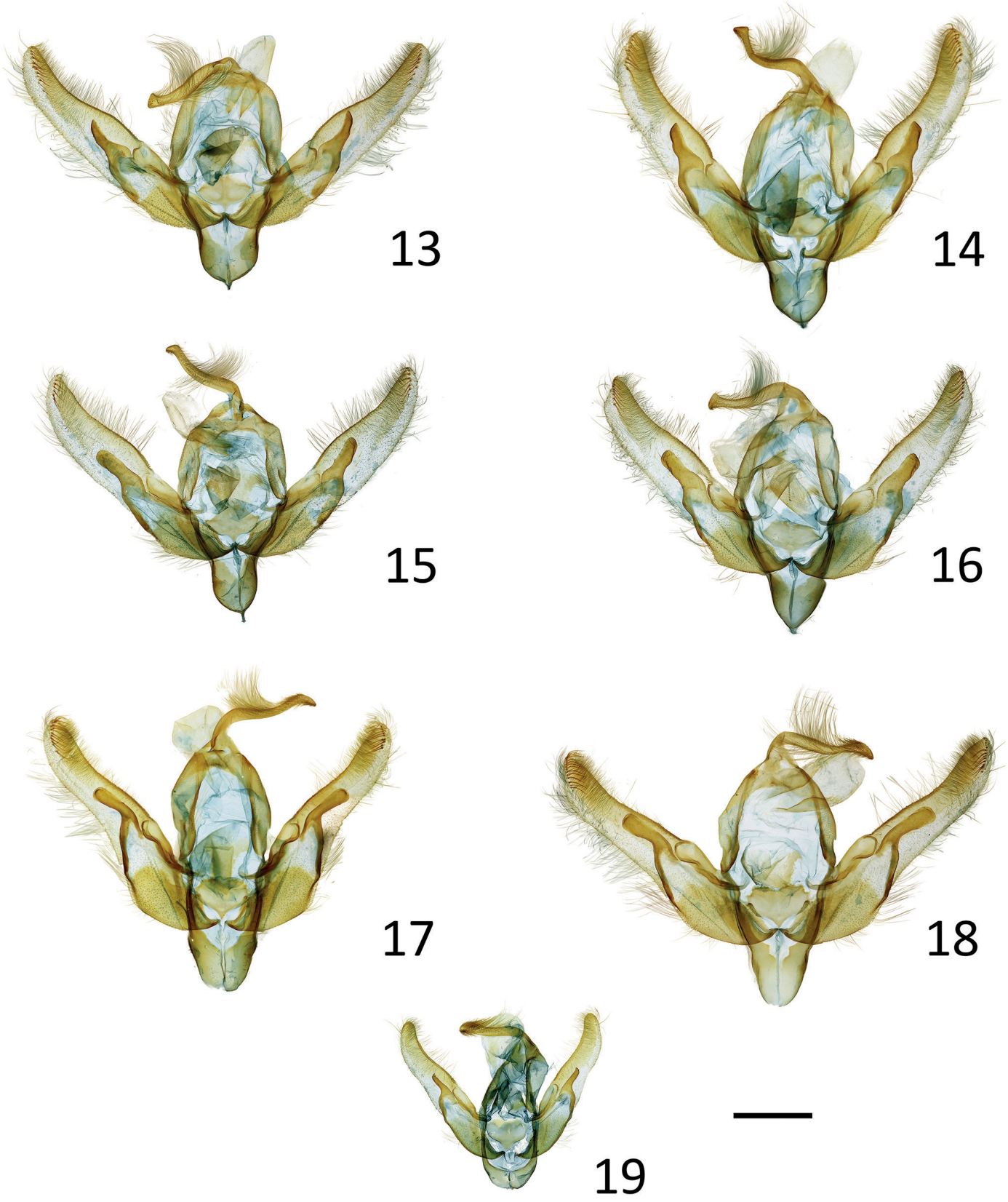
Thorax. Patagium dark at base and pale distally, the dark area occasionally being deeper dark at posterior edge, thus originating midline, but scattered pale or dark scales may occur overall. Tegula palest at middle. Forewing in some specimens with basal field showing thin white basal streak joining with claviform stigma, that however remains separate by interposition of antemedial line; median field darker or with at least darker pattern elements that both basal and inner area of distal fields; crosslines black and thick; subbasal line as two black dots almost adjoining thorax, antemedial line starting as a short black streak externally oriented from costa, then sharply oriented inwards and running obliquely towards below claviform stigma, where it fades or may produce long excurved lobe before anal margin; orbicular stigma conspicuous, rounded or narrow and oblong, with white centre and thickly outlined black, reniform kidney-shaped or fairly irregular, its centre ranging from white to pale brown, and most often thickly outlined black, at least along its inner edge, occasionally orbicular reaching reniform and merged with this, claviform with white centre and thickly outlined black, median shade well expressed only at costa, postmedial line broadly curved beyond discal cell, subterminal line from large preapical dark grey or brown trapezoidal mark at costa, consisting of variably expressed brownish black dots or short wedges, occasionally faded, fully comprised within pale inner area of distal field, outer area of which darker brown or grey, terminal line black, with minute black intervenular dots, fringe concolorous with ground colour. Hindwing uniformly suffused with grey, showing darker grey postmedial line and diffuse discal spot, and with veins more strongly marked than ground colour. Underside of forewing diffuse grey or greyish brown, that of hindwing generally lighter than the upperside, with more sharply expressed discal spot and postmedial line, the former relatively broad and with pale centre. Legs dark grey or brown, conspicuously ringed white at the end of articles and tarsomeres, and also at base of first tarsomeres, tibial spurs bicoloured, white at base and apex.

Abdomen. Rather uniformly greyish brown on either side.

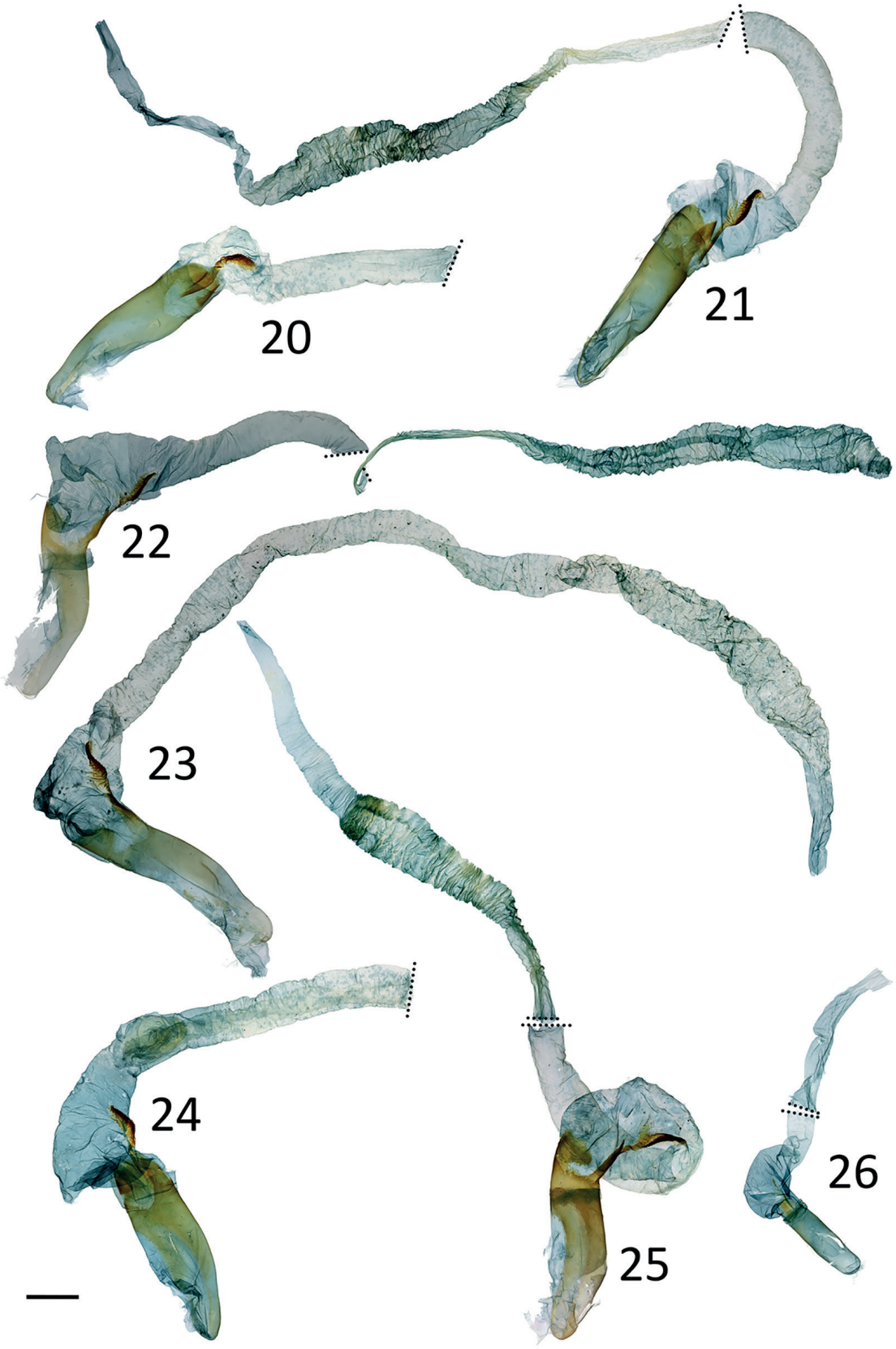
Male genitalia (Figs 13–16, 20–23). Configuration as in subgeneric description; tegumen as long as vinculum. Valva of approximately same width at base and middle, clavus reduced to small setose area at anterior corner of sacculus, this with nearly straight anterior and distal edges, and broadly convex ventral one, costal lobe subovate-subrectangular, clasper with basal plate expanded anteriorly, then flat with comparatively blunt apex. Uncus distinctly sigmoid in side view, upcurved and hairy from middle of its length and with sharply truncate apex devoid of setae. Juxta sub-trapezoid, wider than high. Phallus tubular, slightly bent at middle, vesica approximately four times as long as phallus shaft, globular at base with small lateral ear-shaped lobe, sclerotised bar conspicuous, long and narrow, elevated from vesical membrane and wrinkled, sinuous from above.

Female (Fig. 6)

Size and habitus. Wingspan 35 mm (n = 1). Habitus and pattern elements of the only specimen available as in male,



Figs 13–19 – Male genitalia of *Agrotis (Papuagrotis)* subgen. n. (phalli removed): 13–16, *A. (P.) habbemae* sp. n., surr. Lorentz Reserve, Lake Habbema (paratypi) (13 & 15, grey form; 14 & 16, brown form); **17–18**, *A. (P.) bintangus* sp. n., Star Mountains, 'Bivak 42' (paratypus); **19**, *A. (P.) minutus* sp. n., Mt Giluwe (holotypus). Scale bar = 1 mm.



Figs 20–26 – Phalli of *Agrotis (Papuagrotis)* subgen. n.: 20–23, *A. (P.) habbemae* sp. n. (20, same as fig. 13; 21, same as fig. 14; 22, same as fig. 15; 23, same as fig. 16); **24–25**, *A. (P.) bintangus* sp. n. (24: same as fig. 17; 25, same as fig. 18); **26**, *A. (P.) minutus* sp. n. (same as fig. 19). Dots indicate either broken vesicae or artificial cuts to reconstruct their whole lengths. Scale bar = 1 mm.

with filiform antenna, darker blackish grey ground colour and shorter apical tufting of abdomen.

Female genitalia (Fig. 27). Configuration as in subgeneric description; ostium simple, opening at base of sternum A8, ductus bursae comparatively wide, with some weak longitudinal corrugation, and gradually widening anteriorly, where small corrugated bulge protrudes, appendix bursae approximately three times as long as corpus bursae, its saccate ending comparable in size and shape to corpus itself, gonapophyses flimsy, thinnest distally; ovipositor small, apophyses posteriores much thinner and twice as long as anteriores.

Variability. The new species is very variable as regards the more or less intense mottling of the ground colour with blackish grey or dark brown. Further to this, the ground colour may be predominantly grey or brown so that the individuals can easily be sorted between two quite distinct forms. Such forms, grey and brown, respectively, have not revealed any structural differences, which is why they are here considered to be conspecific. Variability in this species also involves the stigmata, their shape, configuration and dark lining, as for instance, similarly to many other species of *Agrotis*, the orbicular and reniform stigmata may be fully coalescing.

Type material. Holotypus: ♂, **Indonesia**, Papua, [surr.] Lorentz Reserve, Lake Habbema, 4°08' S – 138°42' E, 3457 m, 30.IX-1.X.2018, leg. Rob de Vos (Papua Insect Foundation), KSP-65153, in KSP (via RMNH).
Paratypi (16♂♂, 1♀): 8♂♂, **Indonesia**, Papua, [surr.] Lorentz Reserve, Lake Habbema, 4°08' S – 138°42' E, 3457 m, 30.IX-1.X.2018, leg. Rob de Vos (Papua Insect Foundation), RMNH.INS.1108740–1108745, RMNH.INS.1108752–1108753, in RMNH; 8♂♂, 1♀, idem, 4°08'07" S – 138°42'08" E, 3400 m, 30.IX-2.X.2018, leg. S. & J. Sinnema (Papua Insect Foundation), RMNH.INS.1545036, RMNH.INS.1545040–1545046 (♂♂), RMNH.INS.1545035 (♀), in coll. S. & J. Sinnema, Hemrik.

Etymology. The new species is named after the type locality, in the Lake Habbema area of New Guinea. The name "habbemae" is a noun in the genitive case.

Distribution. Hitherto known only from the type locality, the Lake Habbema area in the Jayawijaya Mountains.

Biology. All specimens have been collected at light in a mountain grassland environment.

Remarks. A second female specimen of *Papuagrotis* (Figs 12, 28) has been collected together with the only female known of *A. (P.) habbemae* sp. n. Despite such specimen might be conspecific with *habbemae*, it shows remarkable differences both in the habitus and genitalia, especially by its small size, almost unicolorous dark blackish grey ground colour, narrower ductus bursae without apparent anterior bulge, shorter appendix bursae in relation to corpus bursae (approximately 2.5 instead of 3 times) with slenderer termination, and particularly flimsy and short apophyses posteriores (Fig. 28). At present it is hardly feasible to assess whether such specimen represents one extreme of the variability of female *habbemae* or another undescribed species, an issue whose solution will be deferred until new material becomes available.

Agrotis* (*Papuagrotis*) *bintangus Vink & Zilli **sp. n.**
(Figs 7–9, 17–18, 24–25)

Diagnosis

Species of *Agrotis (Papuagrotis)* closely similar to *A. (P.) habbemae* sp. n. from which it can be distinguished by the shorter rami of the male antenna, the less convex postmedial line of forewing in correspondence of the reniform stigma, the orbicular and reniform stigmata placed more separate from each other, and the uncus terminating into pointed and slightly downcurved apex. For the distinction from *A. (P.) minutus* sp. n. (described below) see under this species.

Description

Male (Figs 7–9)

Size and colouration. Wingspan 34-39 mm (x = 37 mm; n = 10). Colouration of the head, thorax and the ground colour of the forewing mostly dark brown with some reddish brown, mottled with different shades of brown and with slight white irroration.

Head. Same as in subgeneric description, with antennal rami short, and flagellum substantially filiform from middle of its length.

Thorax. Patagium almost unicolorous dark reddish brown or with slightly paler distal half. Tegula dark reddish brown, with thick black antemarginal line along both inner and outer sides. Forewing with basal field and inner area of distal one feebly paler reddish brown than median one; pattern elements as in *A. (P.) habbemae* sp. n. (described above), with the exception of orbicular stigma, very small or even almost indistinct, and better separate from reniform, smoothly convex postmedial line beyond discal cell, and submarginal line, without big and sharp subtrapezoidal mark at costa and consisting of bigger but more blurred dark reddish brown wedges, often continuous into single line; reniform a white vertical bar or 'pear -shaped' mark with thick black outline. Terminal line black, with rather large black intervenular wedges,

fringe mostly greyish with occasionally darker grey and light reddish brown fades. Hindwing pale fuscous grey, with darker grey postmedial and distal shade; terminal line dark brownish grey, fringe unicolourus pale greyish brown. Underside diffuse greyish brown, paler on hindwing, where discal spot and postmedial line are visible. Legs dark reddish brown, clearly visible ringed white at the end of articles and tarsomeres, tibial spurs white at base and apex.

Abdomen: Rather uniformly dark reddish brown.

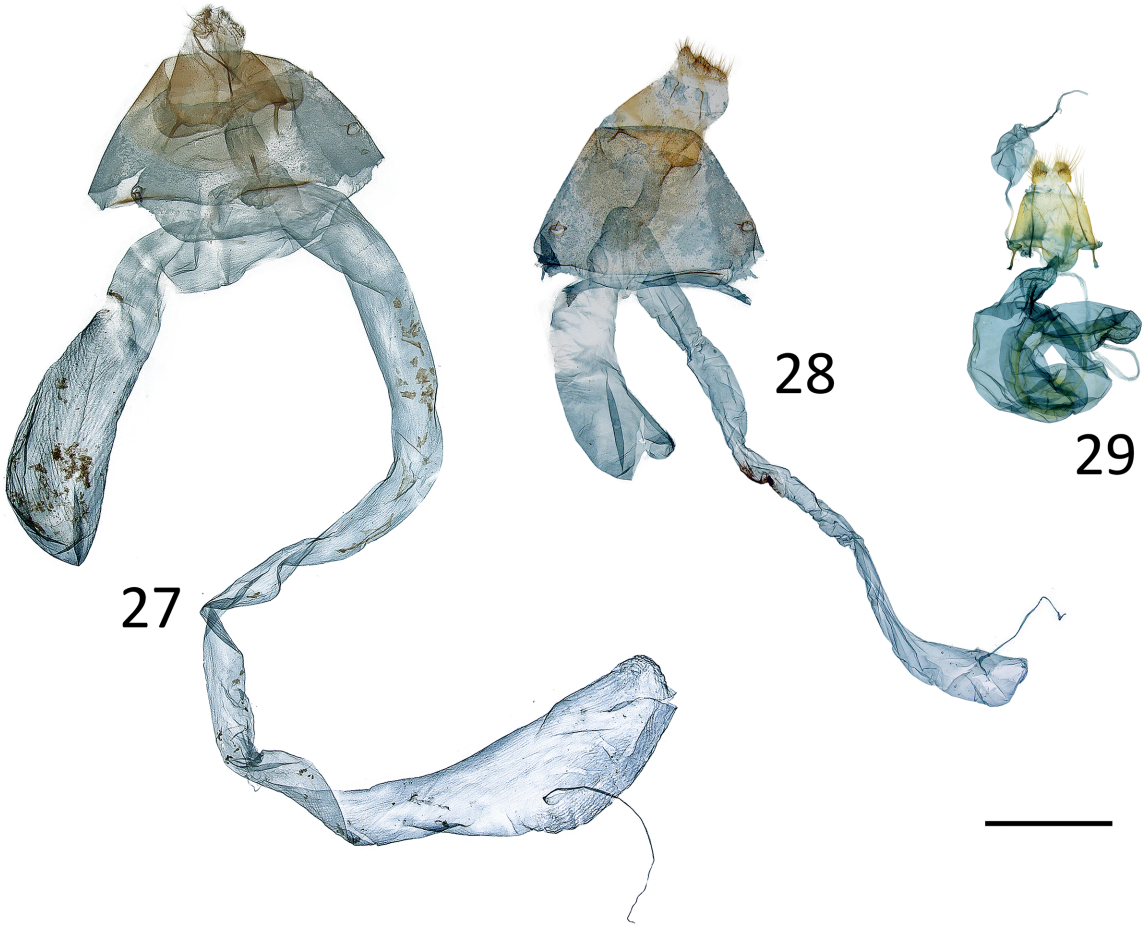
Male genitalia (Figs 17–18, 24–25). Configuration as in subgeneric description; tegumen as long as vinculum. Valva widest at base, slightly incurved beyond sacculus and gradually narrowed from here to apex, clavus present as a minuscule setose lobe, sacculus as in *A. (P.) habbemae* sp. n. (described above), clasper without anterior hump at base, its stalk slightly slenderer than distal part, costal lobe subovate, cucullus narrow, blade-like, slightly upturned. Uncus triple bent, with nail-like apex slightly downcurved after upcurved middle section and downcurved basal part, thickly hairy from second third of its length, with dense short setae at apex, especially at sides and ventrally. Juxta broad, with subrectangular anterior part and large subtriangular posterior one continuing midventrally into rather large triangular plate. Phallus essentially as in *A. (P.) habbemae* sp. n. (see above), albeit comparatively stouter and more incrassate at middle, vesica as in that species but devoid of basal lateral lobelet.

Female
Unknown.

Type material. Holotypus: ♂, [**Indonesia**] [Papua] Nieuw Guinea, Star Mountains, 'Bivak 42', 3400 m, 26.VII.1959, Ned[ederlandsche Sterrengebergte] Exp[editie], RMNH. INS.1557724, in RMNH.

Paratypi (9♂♂): 6♂♂, [**Indonesia**] [Papua] Nieuw Guinea, Star Mountains, 'Bivak 42', 3400 m, 26.VII.1959, Ned[ederlandsche Sterrengebergte] Exp[editie], RMNH. INS.1557725–1557730; 3♂♂, idem, 27.VII.1959; RMNH. INS.1557731–1557733; all in RMNH.

Etymology. The name of the new species is derived from the Indonesian name for Star Mountains, that is "Pegunungan Bintang", to emphasize its provenance. It is meant as a masculine adjective agreeing in gender with the generic name.



Figs 27–29 – Female genitalia of *Agrotis (Papuagrotis)* subgen. n.: 27, *A. (P.) habbemae* sp. n., surr. Lorentz Reserve, Lake Habbema (paratypus); **28**, *Agrotis (Papuagrotis)* sp., surr. Lorentz Reserve, Lake Habbema; **29**, *A. (P.) minutus* sp. n., Mt Giluwe (paratypus). Scale bar = 2 mm.

Distribution. Hitherto known only from the type locality, that has been found to lie on the western slope of Mt Antares (Gunung Antaros) in the Star Mountains (cf. Brongersma & Venema, 1960: 174–176).

Biology. All known specimens were collected at light (John J. Staats, pers. comm.) during the timespan of two days at an elevation of 3,400 m.

Agrotis* (*Papuagrotis*) *minutus Vink & Zilli **sp. n.**
(Figs 10–11, 19, 26, 29)

Diagnosis

A new species of *Agrotis (Papuagrotis)* similar to the other two known members of the subgenus (see above) from which it can easily be distinguished by the markedly smaller size of the individuals and the longest antennal rami in the male sex, not just in relative but in absolute terms. The reniform stigma also appears to be the most tightly curved one with respect to allies. In the genitalia, distinctive are the shallow, U-shaped saccus, very short corona, thick uncus, large subtriangular posterior plate of juxta, broad basisternal invagination of female segment A8, shorter and wider appendix bursae, and longer apophyses posteriores.

Description

Male (Fig. 10)

Size and colouration. Wingspan 28 mm (x = 28 mm; n = 1). Ground colour of the head, thorax and the forewing mostly brown, with some irroration of ash grey and white.

Head. Same as in subgeneric description, with long antennal rami along the basal three quarters of flagellum.

Thorax. Patagium dark blackish brown at base, following with alternating lines of pale reddish brown and white tinges; tegula mixed with black, white and pale brown scales. Forewing with greyish brown basal field showing thin white basal streak with thick black outline that joins with claviform stigma; median field of same colour as basal field; crosslines black, subbasal line as two minute black markings, antemedial externally oblique from costa and projected into acute tooth above discal cell, where it bends inwards, produced into another acute tooth below claviform stigma, this narrow and elongated, thickly outlined black and with dark brown centre, orbicular a small pale brown dot circled by thick black, reniform kidney-shaped, black edged internally and almost dissolved into brown ground colour externally, postmedial line regularly bowed beyond discal cell, waved at veins and lined externally with shining pale brown, submarginal line a series of elongated intervenular black wedges, similarly lined externally, terminal line thin, with black intervenular dots, fringe pale brown. Hindwing irregularly fuscous with paler off-white interspaces sprinkled with grey scales and darker grey brown markings corresponding to crosslines (postmedial, submarginal and terminal), veins and discal lunule, fringe off-white. Underside of forewing suffused brown, slightly darker brown in correspondence of reniform stigma and postmedial line, and with pale beige veins and fringe, that of hindwing white with well-marked brown veins, discal spot, postmedial and terminal lines. Legs slender, variously mottled with pale and dark brown, tarsomeres distally ringed with pale beige.

Abdomen. Uniformly brown coloured.

Male genitalia (Figs 19, 26). General configuration as in subgeneric description, size particularly small; tegumen and vinculum of similar length, the latter broadly U-shaped, with very shallow saccus. Valva slender, slightly sinuous, gradually tapered in its distal third and slightly incurved apically, with roundex apex, clavus a microscopic lobe, sacculus elongated, weakly sclerotised with diffuse distal edge, costal lobe narrow and elongated, subrectangular, clasper short and apically pointed, feebly sinuous, without anterior hump at base, corona very short, of 3-4 spines. Uncus thick, appearing straight but in reality triple bent. Tuba analis with fairly large subscaphium plates. Juxta broad, trapezoidal, with very large inferior triangular plate. Phallus straight tubular, with weak sclerotised bar reduced distally to narrow scobinate plate, vesica broadly rounded at base, as long as twice the phallus shaft.

Female (Fig. 11)

Size and habitus. Wingspan 29 mm (x = 30 mm; n = 1). Habitus and pattern essentially as in male, with longer basal streak adjoining with claviform stigma and particularly long orbicular stigma, this appearing as an elongated white triangle, widest distally, thickly outlined with black. Underside with much more blurred markings.

Female genitalia (Fig. 29). Anterior edge of sternum A8 deeply invaginated mesially to produce broad cup-shaped pouch on the internal wall of which ostium bursae opens, ductus bursae with short and narrow posterior section widened anteriorly into long and broad cupular part, corpus bursae broadly saccate, arched, appendix bursae wide, approximately 2.5 times as long as corpus and with broadly saccate apex, apophyses anteriores stiff, feebly dilated apically. Ovipositor quadrangular, with papillae anales markedly concave distally, and long apophyses posteriores, three times as long as anteriores.

Type material. Holotypus: ♂, [**Papua New Guinea**] [Southern Highlands Province] Papua, Mt Giluwe, 11,000', VI.[19]69, 432/4, [M.J.E.] Coode, P. Wardle & P. Katik [leg.], NHMUK014203428, in NHMUK.

Paratypus: ♀, [**Papua New Guinea**] [Southern Highlands Province] Papua, Mt Giluwe, 11,000', VI.[19]69, 432/7, [M.J.E.] Coode, P. Wardle & P. Katik [leg.], NHMUK014203429, in NHMUK.

Etymology. The name of the new species, being "minute" in Latin, stresses the smaller size of its individuals with respect to other members of the subgenus *Papuagrotis*.

Distribution. Known only from the type locality, Mt Giluwe in the Central Range of Papua New Guinea.

Biology. The only known specimens have been collected on Mt Giluwe at an elevation that seemingly correspond to sites of open forest mixed with grassland.

Discussion

The discovery of a hitherto unknown lineage of montane *Agrotis* with at least three species new to science call for further explorations in the highlands of New Guinea to assess the faunal richness at high elevation in this extremely biodiverse island. The group, here delimited as *Papuagrotis* subgen. n., has seemingly undergone remarkable speciation after isolation by allopatry, in consideration that three samples from separate mountain ranges isolated by distance and barriers such as deep valleys have turned all to represent three distinct species.

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