A REVIEW OF THE PHANUS VITREUS GROUP
(LEPIDOPTERA: HESPERIIDAE: PYRGINAE)

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ABSTRACT.—The "vitreus" group of Phanus was reexamined. Four new species are described: Phanus albiapicalis n. sp., Phanus confusis n. sp., Phanus ecitonorum n. sp., and Phanus grandis n. sp. Two were previously recognized as different but insufficient material existed. The seven included species appear as two subgroups.

KEY WORDS: Argentina, Bolivia, Brazil, Colombia, Costa Rica, Ecuador, El Salvador, French Guiana, Guatemala, Guyana, Hesperiidae, Honduras, Mexico, Neotropical, Nicaragua, Panama, Paraguay, Phanus, Phanus albiapicalis n. sp., Phanus confusis n. sp., Phanus ecitonorum n. sp., Phanus grandis n. sp., Suriname, taxonomy, Trinidad, Venezuela.

The genus Phanus Hübner [1819] (Hesperiidae: Pyrginae), occurring from Mexico south through much of the Neotropics to northern Argentina, was revised by Evans (1952) and again by Miller (1965). The current concept is of five species in three groups: the "obscurior" group, including Phanus obscurior Kaye, 1924, with two subspecies; the "marshallii" group, including the monotypic Phanus marshallii Kirby, 1880; and the "vitreus" group, including three monotypic species, Phanus vitreus (Stoll, 1781), Phanus rilma Evans, 1952, and Phanus australis Miller, 1965. Miller (1965) examined two specimens of the "vitreus" group that could not be placed suggesting that these were still more diverse. The discovery of a new species of this group among a collection from Rondonia in western Brazil prompted me to reexamine the complex. Herein, I describe four new species.

The species of Phanus are very similar with their dark brown ground color and extensive hyaline streaks and macules on both wings. The male genitalia have a distinct lobe or tooth at the caudal end of the ampulla, this more-or-less parallel to a dorsal tooth on the harpe. The female genitalia have a rather wide lamella postvaginalis which is deeply indented on the caudal margin. The "vitreus" group was characterized by the short distal arms (shorter than the undivided portion) of the bifurcated hyaline streak in forewing cell CuA1-CuA2 and the short uncus of the male genitalia (Evans, 1952; Miller, 1965). The streak in forewing cell CuA2-CuA3 has long distal arms and the uncus is longer on both P. obscurior and P. marshallii.

Forewing length is from base to apex. Reference is made to the relative sizes of the macules towards the apex of the forewing of which there are five. The anterior three are considered subapical macules; the posterior two are considered submarginal. Terminology for the structures of the genitalia is after Steinhauser (1981, 1986). Two characters of the male genitalia useful in distinguishing species require additional definition. The uncus in dorsal (or ventral) view is nearly square (unflanged) or with the lateral edges noticeably flared laterally and posteriorly forming distinct lobes (flanged). The costa of the valva has a point on its dorsal edge representing the uppermost point of attachment to the vinculum. The relative position of that point varies between species. Distribution records are for those specimens seen plus additional records from Miller (1965) of unambiguous taxa. Superficial and genitalia characters of the "vitreus" group species are summarized in Tables 1 and 2.

Phanus vitreus (Stoll)
Figs. 1-7 (adults), 20 (♂ genitalia, 27 (♀ genitalia)

Papilio vitreus Stoll, 1781; figs. 7, 15, 21 in Miller (1965)
Papilio momus Fabricius, 1787
Phanus godmani Williams and Bell, 1931

DESCRIPTION.—Forewing length of male = 21.1mm (20.2-22.0, N = 10) and female = 21.3mm (19.9-22.0, N = 5, both samples from Rondonia, Brazil). This species is distinguished from other members of the "vitreus" group by a combination of small subapical spots on the forewing, the hyaline streak in the hindwing discal cell continuous with the discal spot in cell M1-M2, usually a pale streak at the base of CuA2-A on the hindwing, and a small submarginal macule in the same cell. The male genitalia have an unflanged posterior end to the uncus (in dorsal view), the valva is moderately broad, the lobe of the ampulla is dorsally directed, and there is a relatively broad space between it and the short dorsal process of the harpe. The female genitalia are not strongly sclerotized, the papillae anales are narrow, the lamella postvaginalis is short, the antrum is nearly square, and the lamella antevaginalis does not extend laterally beyond the width of the lamella postvaginalis.

DISTRIBUTION AND PHENOLOGY.—This species occurs from southern Mexico south to southern Brazil; records are for every month of the year.


Miller (1965) listed many additional localities for P. vitreus including the following additional countries: Nicaragua, Trinidad. Some of those he gave referred to unrecognized species (see below). Specimens of these and other records (e.g., de Jong, 1983; Brown and Mielke, 1967) need to be reexamined before the distributional details of the various taxa are resolved.

DISCUSSION: - The species was named from Suriname and the type is apparently lost (fide L. D. Miller); it is not at Leiden or London (fide O. Mielke). Unfortunately, there are two very similar species in northeastern South America. One phenotype in the region, and apparently the most widespread, is that with a hyaline streak in the base of cell CuA-2A on the hindwing and the usual presence of a submarginal hyaline macule in the same region, and apparently the most widespread, is that with a hyaline streak in the base of cell CuA-2A on the hindwing and the usual presence of a submarginal hyaline macule in the same cell. The genitalia are as described above. This phenotype has been associated with the name P. vitreus by Godman and Salvin (1879-1901), Evans (1952), and Miller (1965). I thus identify this as Stoll's (1781) concept and designate a male (Fig. 3) at the Carnegie Museum of Natural History as the neotype of Papilio vitreus Stoll (1781). This specimen has the following labels: white, printed - Suri/ / nam; white, handwritten - PHANUS / VITREUS / SURINAM; white, printed and handprinted - Genitalia Vial / GATA - 2334. I have added the following label: red, printed - NEOTYPE / Papilio vitreus Stoll / designated by / G. T. Austin 1992.

The type of Papilio momus, described from French Guiana (Cayenne), is also apparently lost (fide L. D. Miller, Zimsen 1964; it is not at Copenhagen, fide O. Mielke) and, for stability, is considered a synonym of P. vitreus. I designate a male (Fig. 4) at the American Museum of Natural History as the neotype of Papilio momus Fabricius (1787). This specimen has the following labels: white, handwritten - St / Laurent / du / Maroni; white, handprinted - French / Guiana; white, printed and handprinted - Phanus vitreus / (Stoll) / Det. Lee D. Miller, 1985; white, printed and handprinted - Genitalia Vial / GTA - 2219. I have added the following label: red, printed - NEOTYPE / Papilio momus Fabricius / designated by / G. T. Austin 1992.

Phanus godmani was applied to material from Costa Rica (not Nicaragua as stated by Evans, 1952). Williams and Bell (1931) mistook P. marshallii for P. vitreus as their illustration of the genitalia indicates. They thus proposed P. godmani for the phenotype of P. vitreus and illustrated the type and its genitalia. That male specimen (Fig. 5) and a paratype female are now at the Carnegie Museum of Natural History (the genitalia are not with the male type and may still be at the Academy of Natural Sciences, Philadelphia [under "Type Series 7578"] from where the specimen was transferred in the early 1960's, fide J. Rawlins). The [holo]type bears the following labels: white, printed - Costa Rica; white, printed and handprinted - Genitalia Slide / No. 479; white, printed - 852; red, printed and handprinted - TYPE / Phanus / godmani / R. C. Williams, Jr. P. [sic] Bell / [printed sideways on right edge] 7578. I have added the following label: red, printed - HOLOTYPE / Phanus godmani / Williams & Bell / identified by / G. T. Austin 1992. This is obviously of the Central American phenotype of P. vitreus (Figs. 6, 7) which is marginally different from South American populations. Differences include a shorter upper arm of the bifurcate streak in forewing cell CuA-1-CuA-2, a somewhat broader lower arm of this same streak, an often absent basal streak in hindwing cell CuA-2A, and an often absent submarginal macule in the same cell (although both basal and submarginal macules are present on the holotype of P. godmani). The latter two characters seem clinal from Brazil northward to Mexico. I do not choose to recognize these northern populations as a different subspecies, yet a name is available if this is desired at a later time.

Phanus ecitonorum Austin, new sp.

Figs. 8, 9, 34 (adults), 26 (♂ genitalia), 33 (♀ genitalia)

DESCRIPTION: - MALE. Forewing length = 21.1mm (20.4-22.1, N = 10, types, holotype = 21.6). Forewing with costal fold; wings dark brown with extensive white hyaline spots and streaks as typical for genus; bifurcate portion of streak in forewing cell CuA-1-CuA-2 shorter than undivided portion; streak in hindwing discal cell conjoined with discal spot in M1-M2; nearly identical to P. vitreus, differs at type locality as follows: lower arm of bifurcate streak in forewing cell CuA-1-CuA-2 nearly always in two parts, outer third well separated from basal portion (this usually entire or with little separation on P. vitreus); lower spot in CuA-1-CuA-2 of forewing well basad of upper spot (these usually close or slightly overlapping on P. vitreus); short streak in base of hindwing cell CuA-2A absent or, on some specimens, a few pale scales in this position on venter (usually a well defined macule or streak on P. vitreus); submarginal spot in same cell usually absent or represented by a few white scales (usually a well defined macule on P. vitreus); many specimens with gray scaling at forewing apex (this normally entirely dark on P. vitreus); ventral forewing with pale gray along anal margin often extending to outer margin (usually only as far as lower spot in CuA-1-CuA-2 on P. vitreus); both wings with less oливish overscaling than on P. vitreus.

Genitalia: general form of "vitreus" group with short uncus; similar to P. vitreus but differing as follows: valvae with costa having dorsal projecting point nearly at anterior end (this more caudad on P. vitreus), slightly humped posterior to this, sloping gradually to a dorsally pointed or rounded tooth-like process on anterior ampulla (hump more pro-
nounced and process less so on *P. vitreus*), ampulla with dorso-caudally directed lobe at caudal end, slightly serrated anteriorly, well separated from tooth of ampulla (lobe of ampulla more dorsal in orientation and nearer tooth on *P. vitreus*), harpe with thin dorsal point approximating lobe of ampulla and nearly as long (dorsal point of harpe blunt, further separated from and shorter than lobe of ampulla on *P. vitreus*), caudal end of harpe short (generally longer on *P. vitreus*); uncus in ventral view flanged, lateral extensions noticably caudad of midline (caudal end of uncus nearly square or only slightly indented often with central point on *P. vitreus*).

**FEMALE.** Forewing length = 21.4mm (20.8-22.2, N = 6, types). Virtually identical with male; no costal fold, similarly different from female *P. vitreus* at type locality; macules in forewing cell CuA₂,2A overlapping or contiguous; forewing apex without gray scaling.

**Genitalia:** similar to those of *P. vitreus* but differing in several respects as follows: overall more robust; papillae anales broader (in ventral view), especially anteriorly; lamella postvaginals broad, anterior edge concave on either side of the center (thinner and anterior edge smoothly convex or relatively straight on *P. vitreus*); antrum broad and somewhat flared on caudal margin; posterior edge of lamella antevaginals extending laterally beyond lamella postvaginals (antrum narrow and lamella antevaginals extending laterally to about outer edge of lamella postvaginals on *P. vitreus*).

**TYPES.**- Holotype ♂: with the following labels: white, printed - *BRASIL:* Rondonia / 62 km S Ariquemes / linea C-20, 7 km E / B-65, Fazenda / Rancho Grande / 5 December 1991 / leg. G. T. Austin / (associated with / Eciton burchelli); white, printed and handprinted - Genitalic Vial / GTA - 1827; red, printed - HOLOTYPE / Phanus ecitonorum / Austin.


**DEPOSITION OF TYPES.**- The holotype and a female paratype will be deposited at the Universidade Federal do Paraná, Curitiba, Brazil. The remaining paratypes will be deposited in other collections.

**TYPE LOCALITY.**- *BRASIL:* Rondonia; 62km south of Ariquemes, linea C-20, 7km (by road) east of route B-65, Fazenda Rancho Grande, 180m elev. This is approximately 5km northeast of Caacupéland in typical tropical lowland rainforest. Many (21) of the types were collected in association with army ants, principally with *Eciton burchelli* but also with *Labidus praedator* (see Austin et al., 1993). Twelve others were taken in traps baited with putrid fish. The absence of records (except one) prior to 1991 reflects, in part, no work at ant swarms nor the use of traps before that time.

**ETYMOLOGY.**- The species is named after its habit (along with other *Phanus* species) of associating with swarms of *Eciton burchelli* where it feeds on droppings left by ant associated birds.

**DESCRIPTION AND PHENOLOGY.**- This species is known from Costa Rica to southern Brazil; specimens have been taken throughout the year.


**DIAGNOSIS AND DISCUSSION.**- As noted, *P. ecitonorum* is a member of the "*vitreus*" group of *Phanus*, most similar to *P. vitreus* with which it was compared above. This is especially true in the northern portion of the distribution of *P. ecitonorum* from where a majority of specimens need to be dissected for positive identification. The two species are broadly sympatric (Table 3); *P. ecitonorum* has been universally included in series of *P. vitreus*; the female illustrated in Lewis (1987, pl. 85, no. 10) as *P. vitreus* is a *P. ecitonorum*. It is also similar superficially to *P. australis* in lacking the basal and submarginal spots in cell CuA₂-2A on the hindwing, but most of the spots and streaks are less extensive on *P. ecitonorum*, especially the forewing subapical macules which are three times as broad as the two following submarginal macules on *P. australis*. The male valva is different: that of *P. australis* has a narrower, often tooth-like projection on the caudal end of the ampulla instead of the broad lobe on *P. ecitonorum* and the caudal end of the harpe is more triangular-shaped (short and more rounded on *P. ecitonorum*).

**Phanus rilma,** the other described member of the "*vitreus*" group, is also similar but is usually larger in size and the hindwing discal cell streak is separated from the discal spot in M₁-M₂. The male valva of *P. rilma* is narrower than that of *P. ecitonorum*, the anterior point on the costa is situated further caudal (as on *P. vitreus*), and the dorsal tooth of the ampulla is often distinctly serrated. The uncus of *P. rilma* in ventral view is flanged, much as on *P. ecitonorum*. The female genitalia of *P. ecitonorum* are also similar to those of *P. rilma*, more similar than those of *P. vitreus*. On *P. rilma*, the papillae anales are broad and somewhat quadrate; the lamella postvaginals is even more robust than on *P. ecitonorum*, its anterior edge is often somewhat concave centrally.

**Phanus confusius** Austin, new sp.

Figs. 10, 11 (adults), 23 (♂ genitalia), 30 (♀ genitalia)

**DESCRIPTION.**- MALE. Forewing length = 22.6mm (22.2-23.0, N = 3, types and others, holotype = 22.6). Forewing with costal fold; wings dark brown with extensive white hyaline spots and streaks as typical for genus; bifurcate portion of streak in forewing cell CuA₂-2A on the hindwing, but most of the spots and streaks are less extensive on *P. ecitonorum*, especially the forewing subapical macules which are three times as broad as the two following submarginal macules on *P. australis*. The male valva is different: that of *P. australis* has a narrower, often tooth-like projection on the caudal end of the ampulla instead of the broad lobe on *P. ecitonorum* and the caudal end of the harpe is more triangular-shaped (short and more rounded on *P. ecitonorum*).
Phanus albiapicalis Austin, new sp.

Figs. 12, 13 (adults). 22 (♂ genitalia), 29 (♀ genitalia)

Unclassified specimen No. 1, figs. 10, 16 in Miller (1965)

DESCRIPTION.—MALE. Forewing length = 21.0 mm (20.0-21.9, N = 5, types, holotype = 21.9). Forewing with costal fold; wings dark brown with extensive white hyaline spots and streaks as typical for genus; bifurcate portion of streak in forewing cell CuA₁-CuA₂ shorter than undivided portion; streak in hindwing discal cell conjoined with discal spot in M₁-M₂; nearly identical to Phanus vitreus, differs as follows: forewing narrow, noticeably produced (forewing broader with more rounded apex on Phanus vitreus), upper arm of bifurcated streak in forewing cell CuA₁-CuA₂ very short, usually less than 1/4 length of lower arm (longer, usually 1/3 or more of lower arm on Phanus vitreus); forewing with distinct white apex (dark brown or slightly shaded with gray on Phanus vitreus); macules in forewing cell CuA₁-2A usually slightly overlapping; hindwing submarginal macules relatively narrow and square (usually broader with more concave distal and convex proximal margins on Phanus vitreus); hindwing discal macule in cell Rs-M₁ overlaps submarginal macule in M₁-M₂ (these usually distinctly separated on Phanus vitreus or at most contiguous); hindwing narrow and more distinctly produced at vein 2A into a more-or-less distinct tail (hindwing broader, less produced, and blunter at 2A on Phanus vitreus).

Genitalia: general form of "vitreus" group with short uncus; similar to Phanus vitreus but differs as follows: valva broader, anterior edge broad before curving rather abruptly caudad (anterior edge narrower and sloping gradually caudad on Phanus vitreus), division between well-developed tooth and lobe of ampulla deep and "V"-shaped (division less deep and often shallowly "U"-shaped on Phanus vitreus), division between lobe of ampulla and dorsal process of harpe narrow and deep (broader and less deep on Phanus vitreus), dorsal tooth of harpe rather long (shorter on Phanus vitreus), caudal portion of harpe as on Phanus vitreus or slightly longer.

FEMALE. Forewing length = 21.0, 21.3, 22.2 mm. Similar to male; no costal fold; forewing lacks white apex. Genitalia: very similar to Phanus vitreus, lamella postvaginalis broader, caudal margin square with deep indentation; atrium often trifurcate caudally (more-or-less straight on Phanus vitreus).

TYPES.—Holotype ♂ with the following labels: white, handprinted - Catemaco, Ver. / Mex. VIII-58 / T. Escalante; white, printed and handprinted - Genitalia Vial / GTA - 2233; red, printed - HOLOTYPE / Phanus confiisis / Austin.

Paratypes (4 ♂): MEXICO.—Veracruz: Presidio, Apr 1940, leg. C. C. Hoffmann (1 ♂); Aug 1939, leg. C. C. Hoffmann (1 ♂); Aug 1948, leg. T. Escalante (1 ♂), Serrania de Motorango, leg. Toro (1 ♂).

DEPOSITION OF TYPES.—The holotype and three paratypes are at the American Museum of Natural History and one paratype is at the Allyn Museum of Entomology.

TYPE LOCALITY.—MEXICO: Veracruz; Catemaco.

ETYMOLOGY.—The species is named after its confusion with the Phanus vitreus complex.

DIAGNOSIS AND DISCUSSION.—Superficially, Phanus confiisis is very similar to other taxa of the "vitreus" group. They were considered as Phanus vitreus by Miller (1965). I initially thought this was possibly a subspecies of Phanus rilma based upon the the long and broad wings and the genitalia but with the hindwing discal streak and discal macule conjoined. Sympathy with Phanus rilma, however, quickly dispatched that idea. I also considered that Phanus confiisis may be a northern subspecies of Phanus ectororum. Superficial differences (larger size, broader hyaline markings) and somewhat different genitalia led me to consider this as a full species. Additional material may prove otherwise.

The species differs from Phanus vitreus by its larger size, broader markings and different male and female genitalia (see keys). The smaller subapical markings differentiates it at once from Phanus australis which has a very different distribution.

Phanus albiapicalis Austin, new sp.

Figs. 12, 13 (adults), 22 (♂ genitalia), 29 (♀ genitalia)

Unclassified specimen No. 1, figs. 10, 16 in Miller (1965)

DESCRIPTION.—MALE. Forewing length = 21.0 mm (20.0-21.9, N = 5, types, holotype = 21.9). Forewing with costal fold; wings dark brown with extensive white hyaline spots and streaks as typical for genus; bifurcate portion of streak in forewing cell CuA₁-CuA₂ shorter than undivided portion; streak in hindwing discal cell conjoined with discal spot in M₁-M₂; nearly identical to Phanus vitreus, differs as follows: forewing narrow, noticeably produced (forewing broader with more rounded apex on Phanus vitreus), upper arm of bifurcated streak in forewing cell CuA₁-CuA₂ very short, usually less than 1/4 length of lower arm (longer, usually 1/3 or more of lower arm on Phanus vitreus); forewing with distinct white apex (dark brown or slightly shaded with gray on Phanus vitreus); macules in forewing cell CuA₁-2A usually slightly overlapping; hindwing submarginal macules relatively narrow and square (usually broader with more concave distal and convex proximal margins on Phanus vitreus); hindwing discal macule in cell Rs-M₁ overlaps submarginal macule in M₁-M₂ (these usually distinctly separated on Phanus vitreus or at most contiguous); hindwing narrow and more distinctly produced at vein 2A into a more-or-less distinct tail (hindwing broader, less produced, and blunter at 2A on Phanus vitreus).

Genitalia: general form of "vitreus" group with short uncus; similar to Phanus vitreus but differs as follows: valva broader, anterior edge broad before curving rather abruptly caudad (anterior edge narrower and sloping gradually caudad on Phanus vitreus), division between well-developed tooth and lobe of ampulla deep and "V"-shaped (division less deep and often shallowly "U"-shaped on Phanus vitreus), division between lobe of ampulla and dorsal process of harpe narrow and deep (broader and less deep on Phanus vitreus), dorsal tooth of harpe rather long (shorter on Phanus vitreus), caudal portion of harpe as on Phanus vitreus or slightly longer.

FEMALE. Forewing length = 21.0, 21.3, 22.2 mm. Similar to male; no costal fold; forewing lacks white apex. Genitalia: very similar to Phanus vitreus, lamella postvaginalis broader, caudal margin square with deep indentation; atrium often trifurcate caudally (more-or-less straight on Phanus vitreus).

TYPES.—Holotype ♂ with the following labels: white, printed and handwritten - Fortin de las Flores, / Ver., Mex. VIII-15-1967 / H. A. Freeman; white, printed and handwritten - Genitalia Vial / GTA - 2232; red, printed - HOLOTYPE / Phanus albiapicalis / Austin.


DEPOSITION OF TYPES.—The holotype and six paratypes are deposited at the American Museum of Natural History, one paratype is at the Carnegie Museum of Natural History and two paratypes are at the Allyn Museum of Entomology.

TYPE LOCALITY.—MEXICO: Veracruz: Fortin de las Flores.

ETYMOLOGY.—The species is named after the white-tipped forewing of the male.
specimen and the genitalia of a Phanus (unclassified specimen No. 1) from Guatemala which he considered as "probably an aberrant vitreus." Steinhauser (1975) said that among P. vitreus from El Salvador "some males have white scaling at apex of upper forewing." Additional material from Mexico and Central and South America indicates that these were of an unnamed species here described as P. albiapicalis. It is very similar to P. vitreus to which it was compared above. Phanus albiapicalis and P. confusis are the only members of the "vitreus" group known from eastern Mexico where populations were previously referred to P. vitreus (e.g., Miller 1965).

This species is also very similar to P. ecitonorum from which it differs by the distinctly white-tipped forewing of the male, the narrower and more produced wings, the male genitalia which differ from P. ecitonorum in much the same manner as do those of P. vitreus (unflanged uncus, more caudal anterior point on the costa of the valva, a more erect ampulla lobe, blunt dorsal process of the harpe), and the female genitalia which again differ from P. ecitonorum in much the same way as do those of P. vitreus.

Other members of the "vitreus" group, P. confusis, P. rilma, and P. australis, all lack the white-tipped forewing and have broader wings. Phanus rilma is larger than P. albiapicalis and has the streak in the hindwing discal cell not connected to the discal macule in M1-M2. Phanus confusis is also larger. On both P. rilma and P. confusis, the male uncus is flanged and the lobe of the ampulla is less erect and the female genitalia are more robust and heavily sclerotized. Both sexes of P. australis are distinguished from P. albiapicalis by the very broad subapical macules and they have different distributions.

Phanus rilma Evans
Figs. 14, 15 (adults), 25 (♂ genitalia), 32 (♀ genitalia)

Phanus rilma Evans, 1952: figs. 6, 18, 23 in Miller (1965)

**DESCRIPTION.**—MALE. Forewing length = 22.9mm (22.1-23.9, N = 10) and female = 23.9mm (23.2-24.7, N = 8, both samples from Oaxaca, Mexico). This species is large with long and broad wings. The hyaline streak in the hindwing discal cell does not extend distally to the discal macule in cell M1-M2, distinguishing it from the sympatric P. vitreus and P. confusis. Note that some specimens of other taxa of the "vitreus" group have the vein at the end of the hindwing discal cell narrowly dark-scaled and occasionally the hyaline streak is constricted slightly at this vein. On P. rilma, there is a distinct, relatively broad separation between the discal cell streak (which ends proximal to the end of the discal cell) and the discal macule, the proximal end of which actually is within the discal cell (and the vein is sometimes dark scaled). On the forewing, the upper arm of the bifurcate streak in cell CuA1-CuA2 is about 1/3 the length of the lower arm and on males, the apex is dusted with white (but not a sharply defined patch as on P. albiapicalis) and the hyaline streaks are relatively narrow. The hyaline macules on the hindwing, especially in the submargin of males are small, giving the impression of a dark insect. The discal macule in cell Rs-M1 is small or absent and there is no submarginal macule in CuA2-2A.

**Genitalia:** The male valva is narrow (especially caudally), the tooth of the ampulla is usually distinctly serrated, the lobe of the ampulla is long and caudally directed (more so than on P. ecitonorum), and the harpe is very short caudally and has a sharply pointed dorsal projection.

The caudal end of the uncus is flanged as on P. ecitonorum.

**FEMALE.** The female genitalia are robust and rather heavily sclerotized as on P. ecitonorum, the papillae anales are broad and somewhat pointed caudally, the lamella antevaginalis extends laterally beyond the margins of the lamella postvaginalis, and the antrum is flared caudally and its sides are bowed outward at about the middle.

**DISTRIBUTION AND PHENOLOGY.**—This species is known from the Pacific slope of southwestern Mexico and adjacent Guatemala with dates of capture from July to December.


**DISCUSSION.**—This species, described from Guerrero, Mexico (Evans, 1952), is known from a small area in western Mexico and Guatemala (Miller, 1965). The holotype is at The Natural History Museum, London (Evans, 1952; Miller, 1965). Additional material indicates this same distribution with no geographic variation. The separation of the hindwing discal macule from the discal cell streak will distinguish this species from all other "vitreus" group Phanus except for a new species from southern Central America and northern South America named and described below.

Phanus grandis Austin, new sp.
Figs. 16, 17 (adults), 24 (♂ genitalia), 31 (♀ genitalia)

Unclassified specimen No. 2, figs. 11, 24 in Miller (1965)

**DESCRIPTION.**—MALE. Forewing length = 23.5mm (N = 1, Costa Rica), 23.2mm (N = 1, Panama), 22.4mm (N = 1, Colombia). Forewing with costal fold, wings dark brown with extensive white hyaline spots and streaks as typical for genus; bifurcate portion of streak in forewing cell CuA1-CuA2 shorter than undivided portion; similar to P. rilma, differs as follows: upper arm of bifurcate streak in forewing cell CuA1-CuA2 shorter, 1/4 or less length of lower arm; hyaline streaks broader and macules much larger; submarginal macule present in cell CuA2-2A on hindwing; streak in hindwing discal cell fully connected to discal macule in cell M1-M2.

**Genitalia:** Valva similar to P. rilma with serrated tooth on ampulla; lobe of ampulla shorter, more erect (more like P. ecitonorum); valva broader than on P. rilma especially at caudal end; caudal end of uncus widely and deeply flanged.

**FEMALE.** Forewing length = 25.6mm (24.8-26.2, N = 3, types, holotype = 26.2). Similar to male; no costal fold; streak in hindwing discal cell separate from or narrowly conjointed with discal spot in M1-M2.

**Genitalia:** Very different from those of P. rilma; lamella antevaginalis lobate and not extending cephalad as those of other Phanus.

**TYPES.**—Holotype ♀: with the following labels: white, black border, handprinted - Venezuela / Rancho IV, 29 / Grande 1973 / R. L. Zusi; white, printed and handprinted - Allyn Museum / Acc. 1978-26; white, printed and handprinted - Genit. Prep. / SRS - 1232; red, printed - HOLOTYPE / Phanus grandis / Austin.


**DEPOSITION OF TYPES.**—The holotype and paratypes are at the Allyn Museum of Entomology.

**TYPE LOCALITY.**—VENEZUELA.—Aragua: Rancho Grande. I do not like to include specimens away from the type locality in
the type series. This was done here because of the paucity of material and the relative constancy in phenotype of the three examined females. Rancho Grande, Venezuela was chosen as the type locality since there is apparently another specimen from the same location, supposedly at the American Museum of Natural History (Miller, 1965) which I have not examined.

**ETYMOLOGY.** — This is the largest of the known *Phanus*; thus the name meaning large.

**DIAGNOSIS AND PHENOLOGY.** — This very rare species is known only from the three female type specimens, an additional female (not examined) illustrated by Miller (1965), and three males tentatively assigned to this species. These are from Costa Rica, Panama, Colombia, and Venezuela taken in January, April, May, and July.


**DISCUSSION AND DISCUSSION.** — Miller (1965) examined a female *P. grandis* from Venezuela which he considered a possibly unnamed taxon of *P. rilma*. I have seen three additional females (and three males probably of this species) and concur that this was unnamed. The superficial appearance of *P. grandis* (large size, separation on females of the hyaline streak in the hindwing discal cell from the discal macule in cell M₁-M₂) initially associate this phenotype with *P. rilma*. The configuration of the female genitalia, however, indicates that *P. grandis* is a species in itself.

Two nearly identical males at the Carnegie Museum of Natural History labeled "Chiriqui" [Panama] and "Muzo, Colombia" are tentatively associated with *P. grandis*. Another, from Costa Rica, is at the Milwaukee Public Museum. They are large and agree with the phenotype of the females except the discal cell streak on the hindwing is not separated from the discal macule. Their genitalia are different from any other *Phanus* yet seen. Until additional males are examined, particularly from localities with females, this relationship is tentative and the males were not included in the type series.

The broad hyaline markings and genitalia distinguish *P. grandis* from the remaining *Phanus* except *P. australis*. The latter is smaller, has the subapical hyaline macules about three times as broad as the submarginal macules, and the hyaline streak in the hindwing discal cell is connected with the discal macule. The female genitalia of *P. australis* are less robust and sclerotized than those of *P. grandis*.

**Phanus australis** L. D. Miller

Figs. 18, 19 (adults), 21 (♂ genitalia), 28 (♀ genitalia)

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**DESCRIPTION.** — MALE. Forewing length of male = 20.8mm (19-7-21.8, N = 10) and female = 21.8mm (19.8-22.7, N = 10, both samples from Santa Teutonia, Sta. Catarina, Brazil). This species, described from Nova Teutonia, Sta. Catarina, Brazil. It differs from all *Phanus* by the subapical macules on the forewing; these are three times as broad as the two submarginal macules following. It is most similar to *P. vitreus* and *P. ecitonorum*. It further differs from *P. vitreus* and *P. ecitonorum* by the considerable overlap on most individuals of the two macules in Cu₂-2A on the forewing. The basal streak and, often, the submarginal macule in hindwing cell Cu₂-2A present on *P. vitreus* are absent on *P. australis*. The male genitalia are very similar to those of *P. vitreus* except the lobe of the ampulla is generally narrower and not terminally bulbous and the caudal portion of the harpe is longer and triangular-shaped.

**FEMALE.** The female genitalia are nearly identical to those of *P. vitreus*; the papillae anales of *P. australis* appear slightly shorter. The male and female genitalia of *P. ecitonorum* differ from *P. australis* in the same manner as they do from *P. vitreus*. *Phanus grandis* has broad subapical macules but these are not quite as broad as on *P. australis* and the genitalia are different (Tables 1 and 2).

**DIAGNOSIS AND PHENOLOGY.** — This species occurs from Brazil and Bolivia south to northern Argentina with records scattered throughout the year.


**DISCUSSION.** — The holotype male of *P. australis* is at the Carnegie Museum of Natural History and bears the following labels: white, printed and handprinted - June 3 / 1940; white with black margin, printed - Brasilien / Nova Teutonia / 27° 11' S. 52° 23' L. / Fritz Plaumann / [sideways along left margin] 194_; white, printed and handprinted - Carn. Mus. / Acc. 12432; red, handprinted - HOLOTYPE / Phanus / australis / Lee D. Miller; yellow, printed and handprinted - Slide No. M373 / gen. / Carn. Mus. Ent.

**DISCUSSION.**

The review by Miller (1965) indicated that the "vitreus" group of *Phanus* was more diverse than the three species of which he was able to see sufficient material. His two "unclassified specimens" do represent new species and there were two additional species hidden among series of *Phanus vitreus*. This brings to seven the known "vitreus" group species and a total of nine are now known within the genus.

There appear to be two subgroups within the "vitreus" group (Tables, 1, 2). The first, including *P. vitreus*, *P. albipectalis*, and *P. australis* is characterized by the square caudal end of the uncus, the rather erect lobe of the ampulla, medium to long caudal end of the harpe, blunt dorsal tooth to the harpe, narrow papilae anales, and a narrow lamella postvaginalis. One species (*P. vitreus*) is widespread over much of the Neotropics. Another (*P. albipectalis*) overlaps the distribution of *P. vitreus* in Central America (and possibly further south if the Peru and Bolivia specimens are correct) and occurs northward into eastern Mexico. The third species (*P. australis*) is sympatric with *P. vitreus* in...
TABLE 1. Summary of superficial characters of the *Phanus vitreus* group.

<table>
<thead>
<tr>
<th></th>
<th><em>P. vitreus</em></th>
<th><em>P. albiapicalis</em></th>
<th><em>P. australis</em></th>
<th><em>P. ectionorum</em></th>
<th><em>P. rilma</em></th>
<th><em>P. grandis</em></th>
<th><em>P. confusis</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FOREWING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wing shape</td>
<td>short, broad</td>
<td>short, narrow</td>
<td>short, broad</td>
<td>short, broad</td>
<td>long, broad</td>
<td>long, broad</td>
<td>long, broad</td>
</tr>
<tr>
<td>male forewing apex</td>
<td>brown to indistinctly grayish</td>
<td>distinctly white</td>
<td>indistinctly grayish</td>
<td>often distinctly grayish</td>
<td>gray to whitish</td>
<td>gray</td>
<td>indistinctly grayish or not</td>
</tr>
<tr>
<td>upper arm streak in CuA&lt;sub&gt;1&lt;/sub&gt;-CuA&lt;sub&gt;2&lt;/sub&gt;</td>
<td>medium to long</td>
<td>very short</td>
<td>medium to long</td>
<td>medium</td>
<td>short</td>
<td>short</td>
<td>short</td>
</tr>
<tr>
<td>macules in CuA&lt;sub&gt;2&lt;/sub&gt;-2A</td>
<td>separate to slight overlap</td>
<td>usually overlap</td>
<td>usually broad overlap</td>
<td>separate on male, contiguous to slight overlap on female</td>
<td>separate to contiguous</td>
<td>separate</td>
<td>separate</td>
</tr>
<tr>
<td>subapical macules</td>
<td>narrow</td>
<td>narrow</td>
<td>broad</td>
<td>narrow</td>
<td>narrow</td>
<td>narrow</td>
<td>narrow</td>
</tr>
<tr>
<td><strong>HINDWING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>relation of discal macule in Rs-M&lt;sub&gt;1&lt;/sub&gt; and submarginal macule in M&lt;sub&gt;1&lt;/sub&gt;-M&lt;sub&gt;3&lt;/sub&gt;</td>
<td>separate to slight overlap</td>
<td>usually overlap</td>
<td>separate to contiguous</td>
<td>separate to contiguous</td>
<td>widely contiguous to separate</td>
<td>contiguous to slight overlap</td>
<td>separate to slight overlap</td>
</tr>
<tr>
<td>discal cell streak and discal macule in M&lt;sub&gt;1&lt;/sub&gt;-M&lt;sub&gt;3&lt;/sub&gt;</td>
<td>conjoined</td>
<td>conjoined</td>
<td>conjoined</td>
<td>conjoined</td>
<td>separate</td>
<td>conjoined on male, conjoined mostly separate</td>
<td>on female</td>
</tr>
<tr>
<td>basal macule in CuA-2A</td>
<td>usually present</td>
<td>absent</td>
<td>absent</td>
<td>absent</td>
<td>absent</td>
<td>absent</td>
<td>absent</td>
</tr>
<tr>
<td>size anterior submarginal macules</td>
<td>large</td>
<td>large</td>
<td>large</td>
<td>large</td>
<td>small</td>
<td>medium to large</td>
<td>large</td>
</tr>
<tr>
<td>submarginal macule in CuA&lt;sub&gt;2&lt;/sub&gt;-2A</td>
<td>small to medium</td>
<td>absent to minute</td>
<td>absent to minute</td>
<td>absent to minute</td>
<td>absent</td>
<td>absent to medium</td>
<td>absent to minute</td>
</tr>
<tr>
<td>DISTRIBUTION</td>
<td>S Mexico to S Brazil</td>
<td>E Mexico to Panama, Peru(?)</td>
<td>Brazil (?)</td>
<td>Bolivia to Argentina</td>
<td>Costa Rica to S Brazil</td>
<td>SW Mexico, Guatemala</td>
<td>Costa Rica, Panama, Colombia, Venezuela</td>
</tr>
</tbody>
</table>
TABLE 2. Summary of characters of the male and female genitalia of the *Phanus vitreus* group.

<table>
<thead>
<tr>
<th>Character</th>
<th><em>P. vitreus</em></th>
<th><em>P. albiapicalis</em></th>
<th><em>P. australis</em></th>
<th><em>P. ecitonorum</em></th>
<th><em>P. rilma</em></th>
<th><em>P. grandis</em></th>
<th><em>P. confusis</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MALE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>caudal end of uncus</td>
<td>square</td>
<td>square</td>
<td>square</td>
<td>flanged</td>
<td>flanged</td>
<td>flanged</td>
<td>flanged</td>
</tr>
<tr>
<td>costal point</td>
<td>caudad</td>
<td>caudad</td>
<td>caudad</td>
<td>cephalad</td>
<td>caudad</td>
<td>cephalad</td>
<td>cephalad</td>
</tr>
<tr>
<td>ampulla tooth</td>
<td>weakly to</td>
<td>well</td>
<td>weakly</td>
<td>well</td>
<td>well</td>
<td>weakly</td>
<td>moderately</td>
</tr>
<tr>
<td></td>
<td>moderately</td>
<td>developed,</td>
<td>developed,</td>
<td>developed,</td>
<td>moderately</td>
<td>serrate</td>
<td>developed,</td>
</tr>
<tr>
<td></td>
<td>weakly</td>
<td>weakly</td>
<td>weakly</td>
<td>moderately</td>
<td>serrate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>serrate</td>
<td>serrate</td>
<td>serrate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ampulla lobe orientation</td>
<td>dorsad</td>
<td>dorsad</td>
<td>dorsad</td>
<td>dorso-caudad</td>
<td>dorso-caudad</td>
<td>dorso-caudad</td>
<td>dorso-caudad</td>
</tr>
<tr>
<td>ampulla lobe shape</td>
<td>moderately</td>
<td>moderately</td>
<td>tooth-like to</td>
<td>broadly</td>
<td>broadly</td>
<td>broadly</td>
<td>broadly</td>
</tr>
<tr>
<td></td>
<td>bulbous</td>
<td>bulbous</td>
<td>narrowly</td>
<td>bulbous</td>
<td>bulbous</td>
<td>bulbous</td>
<td>bulbous</td>
</tr>
<tr>
<td>ampulla lobe length</td>
<td>short</td>
<td>short</td>
<td>short</td>
<td>short</td>
<td>long</td>
<td>short</td>
<td>long</td>
</tr>
<tr>
<td>harpe length</td>
<td>medium to</td>
<td>medium to</td>
<td>long</td>
<td>short</td>
<td>short</td>
<td>short</td>
<td>very short</td>
</tr>
<tr>
<td></td>
<td>long</td>
<td>long</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>harpe breadth</td>
<td>broad</td>
<td>broad</td>
<td>broad</td>
<td>broad</td>
<td>narrow</td>
<td>broad</td>
<td>narrow</td>
</tr>
<tr>
<td>harpe tooth</td>
<td>blunt</td>
<td>blunt</td>
<td>blunt</td>
<td>pointed</td>
<td>pointed</td>
<td>pointed</td>
<td>pointed</td>
</tr>
<tr>
<td><strong>FEMALE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sclerotization</td>
<td>moderate</td>
<td>moderate</td>
<td>moderate</td>
<td>strong</td>
<td>strong</td>
<td>strong</td>
<td>strong</td>
</tr>
<tr>
<td>papillae anales</td>
<td>long,</td>
<td>long,</td>
<td>short,</td>
<td>long,</td>
<td>long,</td>
<td>long,</td>
<td>short,</td>
</tr>
<tr>
<td></td>
<td>narrow</td>
<td>narrow</td>
<td>narrow</td>
<td>broad</td>
<td>broad</td>
<td>broad</td>
<td>broad</td>
</tr>
<tr>
<td>lamella postvaginalis</td>
<td>narrow</td>
<td>narrow</td>
<td>narrow</td>
<td>broad</td>
<td>broad</td>
<td>broad</td>
<td>broad</td>
</tr>
<tr>
<td>lamella antevaginalis</td>
<td>narrow</td>
<td>narrow</td>
<td>narrow</td>
<td>broad</td>
<td>broad</td>
<td>broad</td>
<td>broad</td>
</tr>
</tbody>
</table>
Bolivia and probably southern Brazil and occurs still further south to Argentina.

The second subgroup includes *P. ecitonorum*, *P. rilma*, *P. grandis*, and *P. confusis*. These are characterized by the flanged caudal end of the uncus, more caudal orientation of the lobe of the ampulla, a shorter caudal end of the harpe, a more pointed dorsal tooth on the harpe, broad papillae anales, and a broad lamella postvaginalis. Three of the species (except *P. ecitonorum*) have long and broad wings. The most widespread, *P. ecitonorum*, appears to be sympatric with *P. vitreus* over most of its distribution; the latter species occurs further north into northern Central America and southern Mexico. *Phanus ecitonorum* is also sympatric with *P. albiapicalis*, *P. australis*, and *P. grandis*; these latter have small known distributions. One (*P. rilma*) occurs on the west slope of southern Mexico and in adjacent Guatemala. The second (*P. confusis*) occurs in southern and eastern Mexico south to El Salvador and is sympatric in places with *P. albiapicalis*, *P. vitreus*, and/or *P. rilma*. The last species (*P. grandis*) is found in a small area from Costa Rica to Colombia and Venezuela where it is sympatric with *P. vitreus* and *P. ecitonorum* and potentially sympatric with *P. albiapicalis*.

Thus, sympatries between species of the "*vitreus*" group are extensive and as many as three are known to occur together (Tables 1, 3). Each of the first subgroup species are sympatric with another member of the group in at least one location (all three appear to be present at Buenavista, Bolivia); *P. vitreus* occurs with each of the six species of the "*vitreus*" group at one or more locations (Table 3). Three of the four species of the second subgroup have small known distributions and the sympatries among its taxa are correspondingly fewer. The only known sympatries are of *P. ecitonorum* and *P. grandis* in Panama and of *P. rilma* and *P. confusis* in Oaxaca, Mexico. This begs the question of conspecificity among the remaining combinations. Differences in genitalia and superficial characters indicate that *P. rilma* is specifically distinct from *P. ecitonorum* and *P. grandis* and that *P. grandis* is distinct from *P. confusis*. Differences in genitalia also suggest the specific distinctness of *P. ecitonorum* and *P. confusis* although it was suggested in the discussion of the latter that *P. confusis* may prove to be a northern subspecies of *P. ecitonorum*. Over much of tropical America, there are usually two species at any locality, *P. vitreus* and *P. ecitonorum*. These also occur in many of the places within the distributions of more restricted taxa. Often it is necessary to dissect genitalia for definite determination. Female genitalia are often very similar and some specimens need to be compared in series and associated with appropriate males by subtle superficial characters. The following keys, along with Tables 1 and 2 and the figures, will allow identification.

### TABLE 3. Known sympatries of species of the *Phanus vitreus* group.

<table>
<thead>
<tr>
<th>LOCALITY</th>
<th>SPECIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEXICO: Veracruz; Presidio</td>
<td><em>P. albiapicalis</em>, <em>P. confusis</em></td>
</tr>
<tr>
<td>MEXICO: Veracruz; Catemaco</td>
<td><em>P. albiapicalis</em>, <em>P. confusis</em></td>
</tr>
<tr>
<td>MEXICO: Oaxaca; Candelaria</td>
<td><em>P. vitreus</em>, <em>P. rilma</em>, <em>P. confusis</em></td>
</tr>
<tr>
<td>MEXICO: Chiapas; Santa Rosa Comitan</td>
<td><em>P. vitreus</em>, <em>P. confusis</em></td>
</tr>
<tr>
<td>EL SALVADOR: Sta. Tecla</td>
<td><em>P. vitreus</em>, <em>P. albiapicalis</em>, <em>P. confusis</em></td>
</tr>
<tr>
<td>COSTA RICA: Puntarenas; Villa Neilly</td>
<td><em>P. vitreus</em>, <em>P. confusis</em></td>
</tr>
<tr>
<td>COSTA RICA: Cartago; Turrialba</td>
<td><em>P. ecitonorum</em></td>
</tr>
<tr>
<td>COSTA RICA: Puntarenas; Villa Neilly</td>
<td><em>P. vitreus</em>, <em>P. australis</em></td>
</tr>
<tr>
<td>PANAMA: Chiriqui</td>
<td><em>P. vitreus</em>, <em>P. australis</em>, <em>P. albiapicalis</em> (?)</td>
</tr>
<tr>
<td>PANAMA: Cerro Campana</td>
<td><em>P. vitreus</em>, <em>P. australis</em></td>
</tr>
<tr>
<td>PANAMA: Canal Zone; Barro Colorado Is.</td>
<td><em>P. vitreus</em>, <em>P. australis</em></td>
</tr>
<tr>
<td>FRENCH GUIANA: St. (Port) Laurent</td>
<td><em>P. vitreus</em>, <em>P. australis</em>, <em>P. albiapicalis</em> (?)</td>
</tr>
<tr>
<td>COLOMBIA: Muzo</td>
<td><em>P. vitreus</em>, <em>P. confusis</em></td>
</tr>
<tr>
<td>PERU: Iquitos</td>
<td><em>P. vitreus</em>, <em>P. australis</em></td>
</tr>
<tr>
<td>BOLIVIA: Province del Sara</td>
<td><em>P. vitreus</em>, <em>P. australis</em></td>
</tr>
<tr>
<td>BOLIVIA: Rio Songo</td>
<td><em>P. vitreus</em>, <em>P. albiapicalis</em>, <em>P. confusis</em></td>
</tr>
<tr>
<td>BOLIVIA: Coroico</td>
<td><em>P. vitreus</em>, <em>P. confusis</em></td>
</tr>
<tr>
<td>BOLIVIA: Buenavista</td>
<td><em>P. vitreus</em>, <em>P. australis</em></td>
</tr>
<tr>
<td>BRAZIL: Distrito Federal; Sobradinho Woods</td>
<td><em>P. vitreus</em>, <em>P. australis</em></td>
</tr>
<tr>
<td>BRAZIL: Espirito Santo</td>
<td><em>P. vitreus</em>, <em>P. albiapicalis</em>, <em>P. confusis</em></td>
</tr>
<tr>
<td>BRAZIL: Goias; Cavalcante</td>
<td><em>P. vitreus</em>, <em>P. albiapicalis</em>, <em>P. confusis</em></td>
</tr>
<tr>
<td>BRAZIL: Para; Obidos</td>
<td><em>P. vitreus</em>, <em>P. albiapicalis</em>, <em>P. confusis</em></td>
</tr>
<tr>
<td>BRAZIL: Para; Benevides</td>
<td><em>P. vitreus</em>, <em>P. albiapicalis</em>, <em>P. confusis</em></td>
</tr>
<tr>
<td>BRAZIL: Rondonia; Cacaulandia</td>
<td><em>P. vitreus</em>, <em>P. albiapicalis</em>, <em>P. confusis</em></td>
</tr>
</tbody>
</table>

1. from Brown and Mielke (1967)
2. from Miller (1965)


Fig. 20. *Phanus vitreus* - ♂ genitalia, (a-d) BRAZIL: Rondônia. (a) tegumen, gnathos, uncus, and associated structures, lateral view; (b) posterior tip of uncus, dorsal view; (c) left valva, lateral-exterior view; (d) penis, lateral view; (e) BRAZIL: Rondônia, left valva, lateral-exterior view; (f) COSTA RICA: Limón Prov., left valva, lateral-exterior view.

Fig. 21. *Phanus australis* - ♂ genitalia, (a-d) BRAZIL: Santa Catarina. (a) tegumen, gnathos, uncus, and associated structures, lateral view; (b) posterior tip of uncus, dorsal view; (c) left valva, lateral-exterior view; (d) penis, lateral view; (e) BRAZIL: Santa Catarina, left valva, lateral-exterior view; (f) BOLIVIA: Buenavista, left valva, lateral-exterior view.

Fig. 22. *Phanus albiapicalis* - ♂ genitalia, MEXICO: Veracruz. (a) tegumen, gnathos, uncus, and associated structures, lateral view; (b) posterior tip of uncus, dorsal view; (c) left valva, lateral-exterior view; (d) penis, lateral view.
Fig. 23. Phanus confusis -♂ genitalia, MEXICO: Oaxaca. (a) tegumen, gnathos, uncus, and associated structures, lateral view; (b) posterior tip of uncus, dorsal view; (c) left valva, lateral-exterior view; (d) penis, lateral view.
Fig. 24. Phanus grandis -♂ genitalia, PANAMA: Chiriqui. (a) tegumen, gnathos, uncus, and associated structures, lateral view; (b) posterior tip of uncus, dorsal view; (c) left valva, lateral-exterior view; (d) penis, lateral view.
Fig. 25. Phanus rilma -♂ genitalia, (a-d) MEXICO: Oaxaca. (a) tegumen, gnathos, uncus, and associated structures, lateral view; (b) posterior tip of uncus, dorsal view; (c) left valva, lateral-exterior view; (d) penis, lateral view; (e) MEXICO: Oaxaca, left valva, lateral-exterior view.
Fig. 26. Phanus ecitonorum -♂ genitalia, (a-d) BRAZIL: Rondônia. (a) tegumen, gnathos, uncus, and associated structures, lateral view; (b) posterior tip of uncus, dorsal view; (c) left valva, lateral-exterior view; (d) penis, lateral view; (e) BRAZIL: Rondônia, left valva, lateral-exterior view.
Key to the males of the "vitreus" group of Phanus

1. Posterior end of uncus more-or-less square in dorsal view

2. Posterior end of uncus flanged in dorsal view

3. Subapical forewing macules three times as broad as submarginal macules, lobe of ampulla narrow and often tooth-like; southern Brazil and Bolivia to Argentina .... P. australis

4. Subapical macules much narrower, lobe of ampulla broad and bulbous; widespread ...

5. Wings narrow, forewing apex distinctly white .......

6. Hyaline streak in hindwing discal cell separate from discal macule in cell M₃-M₄, submarginal macules of hindwing large ...

7. Eastern Mexico and northern Central America .... P. confusis

8. Smaller, tooth of ampulla not strongly serrated; southern Central America and South America .... P. ecitonorum

9. Larger, tooth of ampulla strongly serrated; Costa Rica to northern South America .... P. grandis

Key to the females of the "vitreus" group of Phanus

1. Genitalia not heavily sclerotized, lamella antevaginalis narrow, papillae anales narrow

2. Genitalia heavily sclerotized, lamella antevaginalis broad, papillae anales broad

3. Subapical forewing macules three times as broad as submarginal macules; southern Brazil and Bolivia to Argentina .... P. australis

4. Subapical macules much narrower; widespread ...

5. Wings broad, posterior margin of antrum relatively straight .... P. vitreus

6. Hyaline streak in hindwing discal cell completely conjoined with discal macule in cell M₂-M₃ ...

7. Hyaline streak in hindwing discal cell separate from or narrowly connected to discal macule in cell M₂-M₃ ...

8. Larger; eastern Mexico and northern Central America .... P. confusis

9. Smaller; southern Central America and South America .... P. ecitonorum

10. Submarginal macules on hindwing usually small; southwestern Mexico and western Guatemala .... P. ritma

11. Submarginal macules on hindwing large; Costa Rica to northern South America .... P. grandis

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1. The characters separating P. grandis from P. ecitonorum and P. ritma are tentative pending the examination of additional males of P. grandis.
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LITERATURE CITED

Austin, G. T., J. P. Brock, and O. H. H. Mielke

Brown, K. S., Jr., and O. H. H. Mielke

de Jong, R.

Evans, W. H.

Fabricius, J. C.

Godman, F. C., and O. Salvin

Lewis, H. L.

Miller, L. D.

Steinhauser, S. R.


Stoll, C.

Williams, R. C., and E. L. Bell

Zimsen, E.