New Zealand's most enigmatic moth – what we know about *Titanomis sisyrota*

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Robert J.B. Hoare

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A B S T R A C T

Because of its apparent extreme rarity and the difficulty of placing it within the current definition of any lepidopteran superfamily, *Titanomis sisyrota* Meyrick can be regarded as New Zealand's most enigmatic moth. There are only ten reliable records, from which eight specimens are known to survive; only one is known to be male, and the best specimen is a female in the Museum of New Zealand, Te Papa. Details of means of capture are only available for two of the surviving specimens of *T. sisyrota*, and for one of the lost specimens. Interestingly, both extant specimens (one of which is the holotype) with preserved data were captured by women in drawing-rooms. The most recent specimen was captured at floodlights on the Waipapa Dam. The moth is quite large (wing span c. 60 mm) with shaggy hindwings and is darkish brown with dark streaking on the veins and a whitish border to the forewings. Most morphological features of *Titanomis* that have been examined are consistent with the characters listed for Cossoidea, although they cannot be used to infer close relationships between taxa, and, unlike Cossoidea, it has a moderately well developed proboscis. The very extensile and well sclerotised ovipositor of the female of *Titanomis* strongly suggests that the eggs are inserted into the larval food source, the main candidate being rotten wood, or, alternatively, a large bracket fungus or the soft leaf-bases of a large monocotyledonous plant. Species of which females come to light much more often than males tend to be those that feed on scattered resources, especially moths associated with wetlands. The colouring, however, may suggest a forest habitat. Since 1959, when the last specimen of *Titanomis* was taken, extensive sampling of moths has been carried out throughout New Zealand by a number of collectors, without its rediscovery, but it is premature to regard it as extinct. A proposed strategy for rediscovery includes producing captivating publicity about the mystery surrounding the moth and giving it a common name such as the 'Frosted Phoenix'.

Keywords: *Titanomis*, Lepidoptera, endemic moth, rare species, search strategy.

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1. Introduction

Titanomis sisyrota Meyrick (Fig. 1) can with good reason be regarded as New Zealand's most enigmatic moth. It earns this title both from its apparent extreme rarity and from the difficulty or impossibility of placing it within the current definition of any lepidopteran superfamily.

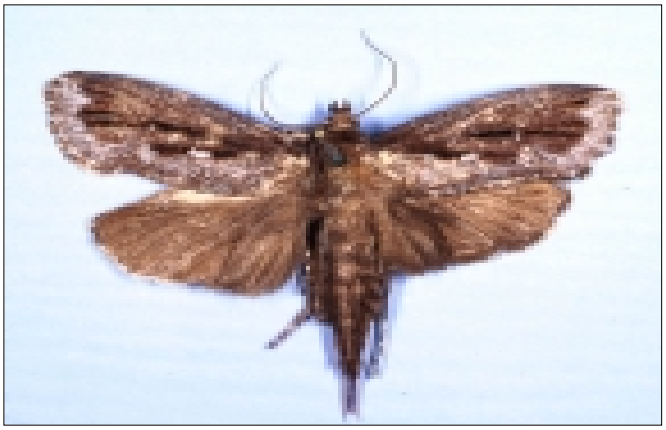

Figure 1. *Titanomis sisyrota* (Lepidoptera).

Although a number of species are known from fewer specimens (e.g. *Petasactis technica* Meyrick (Tineidae), *Thectophila acmotypa* Meyrick (Cosmopterigidae) (see Patrick & Dugdale 2000)), most of these are small moths which are likely to be inconspicuous in all life stages, and which have probably been overlooked. *Titanomis sisyrota*, on the other hand, is quite a large moth (wingspan c. 60 mm), and is much less likely to have escaped the attention of entomologists unless genuinely scarce or extremely localised.

Likewise, although other New Zealand moths remain unplaced to superfamily (*Cadmogenes literata* Meyrick, *Tanaoctena dubia* Philpott and '*Lysiphragma*' *argentaria* Salmon), two of these are relatively common species with known life histories. The third, *L. argentaria*, is confined to the Three Kings Islands and, like *Titanomis*, has an unknown biology, but it appears to be relatively common in its restricted range.

Titanomis sisyrota was listed as a species in need of urgent conservation action by Patrick & Dugdale (2000: 16). Active conservation of a species relies on at least some understanding of its biology and habitat requirements. Because the records of *Titanomis* are so scattered both in time and space, and because its relationships have so far proved obscure, no specific conservation strategy has been possible. Moreover, conservation may be inappropriate, as it cannot be ruled out that the taxon is extinct (Patrick & Dugdale 2000). Therefore, the information and recommendations presented in this paper are aimed in the first place towards the rediscovery of the species.

It should be pointed out here that much of what is written below rests on the assumption that *Titanomis* is (or was) a resident, endemic New Zealand moth. However, its scattered pattern of occurrence might suggest that it is a sporadic immigrant to this country. If this is the case, conservation action in New Zealand is again inappropriate. My reason for treating the moth as a resident is simply that this is the most parsimonious explanation of the data. A number of immigrant Lepidoptera occur more or less regularly in New Zealand, and some have become established here, but the great majority of these visitors are well-known Australian species. It has to be admitted that some immigrant species have been collected in New Zealand but never apparently elsewhere. For example, the single specimen of the noctuid genus *Chasmina* to have been taken in this country cannot be matched with any known Australian or Pacific

species in the NZAC, ANIC or BMNH (R. Hoare, unpubl.). It is still to be considered an immigrant because the genus is otherwise entirely exotic, and because the moth has only occurred once in New Zealand. *Titanomis* on the other hand has no known close relatives elsewhere, and has been taken several times in this country. Many species of Lepidoptera, some undoubtedly large and systematically isolated, remain to be collected in Australia, and it cannot be completely ruled out that *Titanomis* is amongst them, but until it is found outside New Zealand, it must surely be regarded as a rare endemic species.

2. Known information about *Titanomis sisyrota*

The standard two-letter area codes of Crosby et al. (1976) have been used below when listing locality details.

2.1 THE MOTH'S HISTORY

There is a certain amount of confusion in the literature relating to *Titanomis sisyrota*, making it difficult to assess the exact number of specimens that have been taken. However, I regard there as being ten reliable records, from which eight specimens are known to survive (Table 1). I have seen all specimens in New Zealand collections, and label data from those in the British Museum (Natural History) have been taken from notebooks made by J.S. Dugdale during a visit to that collection (Dugdale, ms.). The summary below is compiled from four main sources: (1) the label data on the specimens themselves; (2) G.V. Hudson's hand-written specimen register in the Museum of New Zealand, Te Papa, Wellington (Hudson, ms.); (3) the account by H. Hamilton (1921), containing information supplied to him by Hudson (presumably in a letter); (4) Hudson's account (Hudson 1928).

TABLE 1. RECORDS OF *Titanomis sisyrota* IN NEW ZEALAND.

NO.	DATE	LOCALITY	COLLECTOR	SEX	SOURCES	DEPOSITORY
1	1874 (Dec)	Greymouth WD	R. Helms	♀	1, 2, 3, 4	BMNH
2	1870s	Nelson NN	'an old man'	♀	2, 3, 4	MONZ
3	1870s	(probably) Nelson NN	A.P. Buller	♂	2, 3, 4	MONZ
4	1882 (11 Feb)	Wakapuaka, Nelson NN	Miss Collins	♀	2, 3, 4	BMNH
5	1883	Blenheim MB	J. Purdie?	♀	4	?BMNH
6	1886 (Mar)	Otaki WN	Clement W. Lee	♀	2, 3, 4	MONZ
7	1898	Dun Mt, Nelson NN	Bannelor	♀?	2, 4	lost
8	1900 ('summer')	Haldane SL	Robert Gibb	?	1, 2, 3, 4	NZAC
9	1921 (12 Jan)	Rangataua TO	Mrs H. Hamilton	♀	1, 2, 3, 4	MONZ
10	1959	Waipapa Dam WO	Charles Hudson Guard	♀?	J.S. Dugdale (pers. comm.)	lost

The following notes, numbered by specimen, relate to the collation of the information in Table 1 from the sources listed above:

1. This specimen is listed by Hamilton (1921) as taken 'by the late R. Helms in 1874 – presumably on the West Coast', but Hudson (1928) is more precise, giving 'Greymouth in December, 1874'.

2, 3. Hudson (1928: 350) refers to 'specimens…taken at Nelson, probably about the same time [as Helms' specimen]'. One of these must be the specimen in the Hudson collection referred to by Hamilton (1921) as having been taken 'in the Nelson district in the "seventies"', and in Hudson's register (specimen 27c) as 'from a collection made by an old man at Nelson and presented to Nelson Museum by Mr Kingsley' (no. 2 in Table 1). This specimen (Fig. 1), although rather poorly set, is in better condition than any other currently known in New Zealand collections, and appears to be the one used by Hudson (1928: pl. xxv) for his illustration.

   The other is here presumed to be the specimen from the A.P. (Percy) Buller collection (no. 3 in Table 1), which is without label data but listed as 'probably from the Nelson district' by Hamilton (1921). This specimen is the only known male. (It has been dissected and bears the NZAC number L590.) In the Hudson register, the locality of Buller's capture is given as Nelson without any query.

   However, on the same page as his mention of 'specimens…taken at Nelson', Hudson (1928) separately refers to the Buller specimen without indicating a probable locality. Hence there is some confusion about the true number of Nelson records.

4. This specimen is the holotype. It bears the Hudson register number 27a, and is listed in the register as follows: 'Sent to Mr [H.T.] Stainton May 12 1885 and forwarded by him to Meyr[ick] who descr[ibed] it…'; 'at light in the Collinses' drawingroom, Wakapuaka, Nelson Feb 11- 82.' Meyrick (1888) was in error in stating that the specimen was taken at 'Wellington in May…by Mr G.V. Hudson': the error clearly arose from a confusion between details of the capture of the specimen and details of its dispatch to England. The specimen is labelled in Meyrick's handwriting 'G.V. Hudson Wellington 10.5.85' (Dugdale 1988).

5. The Blenheim specimen was presumably unknown to Hudson in 1921, when he wrote to Hamilton about *Titanomis*, as it is not mentioned by Hamilton (1921). However, Hudson did mention it later (Hudson 1928). It is presumed to be the specimen in the BMNH with an accession label 'N. Zealand 82-120' and a label stating 'named by Drnt [Durrant]'. The BMNH register gives the following under accession number 1882-120: '45 Insects of various Orders…New Zealand…Pres. by J. Purdie Esq.' (K.R. Tuck, pers. comm.). (The specimen has been dissected and the genitalia are on BMNH slide 5378.) As 1882 was the year of accession to the BMNH collection, the specimen cannot have been taken in 1883 as stated by Hudson (1928), but since this is the only record unaccounted for from this time period, it seems reasonable for the moment to match it with the extant specimen.

6. Details of the Otaki specimen are most fully documented by Hamilton (1921). It is specimen 27b in the Hudson collection.

7. Hudson (1928) gives a record from 'Nelson in 1898'. This record is again absent from Hamilton's (1921) account, and must have been unearthed later. The specimen does not appear to have survived, but there is a record in Hud-

son's register of the species having been taken 'by Bannelor on Dun Mt'. Having no further information on Bannelor, I have here presumed that these two records are one and the same.

8. The Haldane specimen was apparently collected dead (Hamilton 1921), and consists of a thorax and the left pair of wings. Given its poor condition, it is impossible to be certain of the sex, but its size and colour pattern suggest that it might be a male. The only male specimen known is the Buller specimen. The name of the collector (Robert Gibb) and the time of year ('summer') are taken from Hudson's register.
9. A full account of the capture of this specimen is given by Hamilton (1921). Although he refers to the specimen as 'a fine female', the moth is not in good condition, with the thorax largely denuded of scales (perhaps as a result of being captured in a matchbox!).
10. Details of the most recent capture of *Titanomis* were supplied by J.S. Dugdale (pers. comm.). It was amongst specimens supplied to Dugdale by Mr Charles Hudson Guard, an employee of the Hydroelectricity Department, from the Waipapa Dam, Waikato River, in 1959. The tobacco tin containing the specimen was subsequently mislaid.

Further historical research relating to some of the personalities involved in the *Titanomis* story (e.g. Bannelor, J. Purdie) may well uncover significant information, and could overturn some of the conclusions arrived at here.

2.2 MEANS OF CAPTURE OF SPECIMENS

Details of means of capture are only available for two of the surviving specimens of *T. sisyrota*, and for one of the lost specimens. Interestingly, both extant specimens with preserved data were captured by women in drawing-rooms. The holotype (specimen no. 4 in Table 1) was captured by Miss Collins in her drawing-room at Wakapuaka NN. The Rangataua specimen (no. 9 in Table 1) was taken by Mrs H. Hamilton at light in the drawing-room of a Mr and Mrs Larkin (Hamilton 1921). The most recent specimen (no. 10) was captured at floodlights on the Waipapa Dam (Waikato River) (J.S. Dugdale, pers. comm.). Hudson states that 'all specimens of which records have been preserved were captured at light', but it is doubtful whether he had details for any specimens other than those taken by Miss Collins and Mrs Hamilton.

3. Systematics and biology of *Titanomis sisyrota*

3.1 MORPHOLOGICAL FEATURES AND SYSTEMATIC PLACEMENT

When Meyrick (1888) described *Titanomis sisyrota* as a new genus and species, he tentatively placed it in Walsingham's family Anaphoridae, but remarked that this family had not been properly defined. Anaphoridae was based on *Anaphora* Clemens 1859, a junior synonym of *Acrolophus* Poey, 1832. The family is now known as Acrolophidae, and belongs to the superfamily Tineoidea (Davis & Robinson 1999).

Many advances have been made in Lepidoptera classification since Meyrick's day, and many of the morphological features considered important nowadays are structures (e.g. of the genitalia) which can only be viewed on dissection of specimens. Meyrick was averse to making such dissections, and his systematic placement of many genera and species was therefore erroneous (Clarke 1955). *Titanomis* is a case in point: it is excluded from the Tineoidea, and indeed from all 'primitive' ditrysian lineages by its possession of 'tortricoid-type' apodemes on sternite 2 of the abdomen (Dugdale 1988). This character places it firmly in the very diverse group of Lepidoptera known as the Apoditrysia (see Kristensen & Skalski 1999: fig. 2.2). The Apoditrysia includes all the butterflies and most of the larger moths, grouped at present into 28 superfamilies (Kristensen & Skalski 1999).

The correct systematic placement of *Titanomis* remains problematic. Some relevant morphological features were discussed by Dugdale (1988: 214), who excluded it from the Noctuoidea on the basis of its primitive wing-venation (it retains a tubular M-stem in the cell of the hindwing) and its apparent lack of metathoracic tympanal organs and associated abdominal structures (a defining apomorphy (shared derived character) of the superfamily—see Kitching & Rawlins (1999)). Dugdale (1988) indicated that *Titanomis* could possibly be placed in the Cossoidea, but that Schoorl had excluded it from the superfamily following examination of the only known male (J.W. Schoorl pers. comm. to J. S. Dugdale). However, more recently Schoorl's (1990) definition of the Cossidae has been criticised by Edwards (1996) and again by Edwards et al. (1999) as based on too narrow a selection of characters. Most morphological features of *Titanomis* that have been examined are consistent with the characters listed for Cossoidea (Cossidae + Dudgeonidae) by Edwards et al. (1999). However, as most of these are shared ancestral features (plesiomorphies), they cannot be used to infer close relationships between taxa. Unfortunately, *Titanomis* appears to lack at least one of the possible synapomorphies given by Edwards et al. (1999) for Cossoidea, i.e. proboscis strongly reduced or lost, since it has a moderately well developed tongue. The second apomorphy (presence of paired frontoclypeal pits, i.e. pits on the lower part of the 'face') is hard to observe, and has not been searched for in

Titanomis, but these pits are anyway absent from some Australian and New World cossids (Edwards et al. 1999).

A full review of the systematic placement of *Titanomis* is beyond the scope of this paper, and unless a very close relative can be discovered elsewhere in the world with a known biology, this information is unlikely to help in its rediscovery beyond what we can infer already.

3.2 APPEARANCE AND OCCURRENCE

Here I discuss what we can and cannot infer about the biology of *Titanomis* from the information we have on its structure, systematic placement and occurrence.

3.2.1 Inferences from morphology and systematic placement of *Titanomis*

The very extensile and well sclerotised ovipositor of the female of *Titanomis* strongly suggests that the eggs are inserted into the pabulum, and therefore that the larva feeds internally. Internal feeding is a possible apomorphy of the Cossoidea (Edwards et al. 1999), so if *Titanomis* is indeed a cossoid, its systematic placement would also support this inference. It is perhaps unlikely that the pabulum is the woody branches and stems of living trees or shrubs, as most taxa with larvae boring in live wood (e.g. many Sesiidae and Cossidae) lay eggs on the surface of branches, and do not need a particularly extensile ovipositor. *Titanomis* is much more likely to insert its eggs into a relatively soft substrate, the main candidate being rotten wood (cf. *Prionoplus* (Coleoptera: Cerambycidae)), or, conceivably, a large bracket fungus (cf. Arrhenophanidae (Davis & Robinson 1999)). The alternative might be the overlapping leaf-bases or leaf-sheaths, or the soil next to the tillers, of a large monocotyledonous plant (cf. Castniidae (Edwards et al. 1999)). Candidate hosts might include *Gahnia* spp., *Cortaderia* spp. and *Carex secta* Boott in Hook. f.

3.2.2 Inferences from pattern of occurrence of *Titanomis*

Very little can be inferred about the possible biology of *Titanomis* from the few scattered records we have, especially given the imprecise nature of many of the older records. The extensive geographical area over which the captures have been made suggests that its larval food is (or was) also widespread, and it seems unlikely that its rarity is due to restriction to an excessively rare host. It is more plausible that it has narrow ecological requirements; many species of Lepidoptera worldwide are absent from apparently suitable sites containing plentiful supplies of their larval food-source, because of specialist requirements or historical factors which may or may not be known (e.g. in New Zealand, *Kupea electilis* Philpott (Crambidae) (see Patrick & Dugdale 2000)).

Hamilton (1921) thought it was possibly significant that beech (*Nothofagus*) forest was present near all the localities in which the species had been taken. The Waipapa Dam locality, however, is amongst tall kanuka (*Kunzea*) forest (Patrick & Dugdale 2000). J.S. Dugdale (pers. comm.) has pointed out that all

localities (including Waipapa Dam) are (or were at the time of capture) close to stands of valley-floor podocarps such as kahikatea and matai; hence the possibility that the larva is associated with rotten podocarp wood in wet situations cannot be ruled out.

It may be significant that all but one of the *Titanomis* specimens of known sex are females (cf. Hudson 1928). Species of which females come to light much more often than males tend to be those that feed on scattered resources, for example *Galleria mellonella* (L.) (greater wax-moth, Pyralidae), which lays its eggs in honeybee hives (cf. Patrick & Dugdale 2000). One category of moths of which this is especially true is those associated with wetlands. The females of wetland species will often wander far from their breeding grounds in search of new egg-laying sites, whilst the males remain within the wetland habitat and are otherwise rarely encountered. This phenomenon has not been documented in New Zealand, but has been noted in the more intensively studied UK fauna. British examples from the Pyraloidea may be found in Goater (1986), and include *Chilo phragmitella* (Hübner) and *Schoenobius gigantella* (D. & S.), both species associated with large reed-beds. A wetland association for *Titanomis* would fit with the possibility of a large monocotyledon (e.g. *Carex secta*) as host.

3.2.3 The colour-pattern of *Titanomis*

Nothing has been written regarding the possible significance of the somewhat unusual colour-pattern of *Titanomis*, which is well illustrated by Hudson (1928: pl. xxv). Certainly no firm inferences can be drawn, but I suggest some tentative lines of thought here.

The longitudinal dark streaking on the veins is consistent with the supposition of a monocotyledonous host, as such a pattern is frequent in moths feeding on these plants (e.g. *Tmetolophota* spp. (Noctuidae)). However, the ground-colour of *Titanomis* is much darker than that of many wetland grass- and sedge-feeding species, which tend to have ochreous to pale brown forewings that blend in with the stems of the host. The whitish border to the wings is a particularly striking feature of the *Titanomis* pattern, and it might be more plausible to suggest that the moth would be camouflaged against a background of mottled bark, which would indicate a forest habitat, and tend to support the wood-feeding theory.

4. Strategies for discovery of an extant population

4.1 IS *Titanomis* EXTINCT?

Since 1959, when the last specimen of *Titanomis* was taken, extensive sampling of moths has been carried out throughout New Zealand by a number of collectors, especially J.S. Dugdale and B.H. Patrick. This collecting has

included light-trapping, day-time collecting and rearing of larvae. The failure of this collecting effort to rediscover *Titanomis* is disappointing, and has led inevitably to the supposition that it might be extinct (cf. Patrick & Dugdale 2000). However, there have previously been long intervals between captures of the moth (e.g. between 1921 and 1959), and other even larger New Zealand insects have been overlooked for extensive periods of time, e.g. *Deinacrida mahoenui* Gibbs (Orthoptera), which was not discovered until 1962 (Gibbs 1999). Even in such an intensively studied country as the UK, where lepidopterists abound, some quite large moth species have been rediscovered only after very long periods of apparent absence. For example, *Eugraphe subrosea* (Stephens) (Noctuidae) was considered to be extinct following the drainage of its fen habitat in East Anglia in the 1850s, but was found to be resident in North Wales in 1965 (Skinner 1984). Hence it is premature to give up hope for the survival of *Titanomis* in New Zealand.

4.2 STRATEGIES FOR REDISCOVERY

The one thing we can say with certainty about the biology of *Titanomis* is that it is occasionally attracted to light. Hence light-trapping in areas where it has occurred in the past must be the best hope of its rediscovery. Perhaps the North Island areas where the most recent captures were made (Waipapa Dam and Rangataua) should be the prime targets. More speculative searches could be made in any area containing the wetland or lowland podocarp habitats suggested as possible breeding sites.

It is notable that two of the best-documented captures of *Titanomis* were made in drawing-rooms. This may not be significant, but might possibly indicate that the moth is attracted to weaker or less u.v.-rich light-sources than those that are now generally used for light-collecting by field lepidopterists. Certainly, its occurrence at dam floodlights suggests that this is not always the case, but lepidopterists could consider experimenting with different light-sources in their attempts to rediscover the species.

Some cossids (and other large moths) are only weakly attracted to light and may best be collected by other means. In the UK, *Cossus cossus* (L.) only very rarely comes to light, but is reported to be frequently attracted to sugar (Skinner 1985). Sugaring is an old-fashioned collecting technique whereby a sugary solution (usually based on black treacle or molasses) is painted on tree-trunks or fence-posts and visited after dark with a torch to see what moths have been attracted (see Dickson (1976) for a useful account). It is a technique very little used by modern collectors, and hardly at all in New Zealand. The attraction of *Cossus cossus* to the sugar-patch is hard to explain, as this species completely lacks a proboscis. However, *Titanomis*, as noted above, has a well-developed proboscis, and sugaring for the species may conceivably be worth a try.

Many species of moths are much more easily found as larvae than as adults, once their biology is known, and *Titanomis* could eventually prove to be one of these. However, until the adult has been rediscovered, a search for *Titanomis* larvae is liable to be discouraging at best, and at worst destructive. Entomologists searching in rotten wood for other invertebrates should certainly

keep an eye open for large lepidopteran larvae. Likewise some strategic sampling of the stems and roots of potential monocotyledonous hosts could be carried out in possible habitats.

5. Public advocacy to help rediscovery

The more pairs of eyes look for *Titanomis*, the sooner it is likely to be rediscovered. Currently there are so few people in New Zealand actively collecting Lepidoptera that its rediscovery may require a very large slice of luck. If awareness of the rarity and enigmatic nature of the moth can be raised amongst scientists working in the field, DOC staff, and the general public, the chances of success will be much enhanced.

5.1 GENERAL PUBLICITY

A poster in DOC offices could be an effective start to a *Titanomis* publicity campaign. The poster should illustrate the moth clearly (preferably in colour), and indicate its size and the features by which it can be distinguished from other moth species. The mystery surrounding the moth should be explained to attract interest, and there should be an arresting title (for example the poster could take the form of a 'WANTED' sign). As some members of the public (and indeed entomologists) can be very insistent about their incorrect identification of an insect (pers. obs.), I suggest that there be no financial reward offered for the moth's rediscovery.

In addition to the poster, a short note on the moth (and possibly a black-and-white drawing) could be included in DOC leaflets relating to at least some of the areas in which it has been collected.

A photograph of the moth, together with a short write-up, on the DOC website is a further possibility worth considering.

Popular articles might help to generate some interest in *Titanomis* and stimulate further search, although the effect is likely to be more temporary. An article in *Forest and Bird*, and/or in one of the national newspapers would be an excellent start.

5.2 WHAT TO DO IF YOU THINK YOU'VE FOUND *Titanomis sisyrota*

It is very desirable that any specimen of *Titanomis* found should reach a lepidopterist alive, so that the identity can be confirmed and the appropriate action taken. The specimen should anyway be photographed. If a male is

captured, I see little objection to preserving it as a museum specimen, and this is indeed desirable given the fact that the only male so far known is in extremely poor condition. In the more likely event that a female is taken, it is recommended that an attempt should be made to obtain eggs with a view to elucidating the life-history. If the larval substrate is dead wood, there may be some prospect of success; however, potting up large monocotyledons to attract oviposition might be impracticable! In other words, dead wood (possibly with bracket fungi) should be tried in the first instance.

Whichever sex is taken, and whether or not it is decided to release the moth following photography, some part of the specimen (a leg is the obvious choice) should be preserved in 95% ethanol and frozen for future molecular studies. It may be that the phylogenetic placement of the moth will only satisfactorily be resolved by molecular work; at the very least such studies will provide a second line of evidence to help illuminate this question.

5.3 A COMMON NAME

For publicity about *Titanomis* to be effective, it must be assigned a common name.

The scientific name may be interpreted as follows: *Titanomis* is a contraction of Titan (= giant) + anomis (= without law, i.e. anomalous, from Greek 'anomos') (see Emmet (1991: 226, entry under *Anomis*)), and refers to the large size and unusual morphology of the moth for the group in which Meyrick placed it (i.e. what we now call Tineoidea). The species epithet *sisyrota* means 'wearing a shaggy garment' (Greek 'sisyra') and almost certainly refers to the dense hairs towards the inner margin of the hindwing, of which Meyrick (1888) makes special mention in his description.

The moth's large size relative to its supposed primitive relatives, and the shaggy hindwing are not characteristics that would strike a member of the public encountering the moth. I propose instead that the common name should refer to a conspicuous feature of the moth's appearance that may aid in its recognition. The white border to the forewing is one such feature. A hint at the enigmatic nature of the moth would also make for a good name. With these things in mind, I tentatively propose that *Titanomis* be known as the 'Frosted Phoenix'. The mythical phoenix was a bird that lived for 500 years, then set itself alight, upon which a new phoenix would emerge from the flames. Only one phoenix was alive at any time; similarly *Titanomis* has been captured only singly and seems impossibly rare. It is certainly to be hoped that the moth will rise again like the phoenix from the ashes of its apparent extinction.

6. Acknowledgements

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7. References

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