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Australian Endemic *Drosophila* IV.* Queensland Rain Forest Species Collected at Fruit Baits, with Descriptions of Two Species

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Abstract

Australian *Drosophila* species attracted to fermented fruits are mainly of the subgenera *Drosophila* and *Sophophora*. With the exception of *D.* (*Sophophora*) *dispar*, all non-cosmopolitan species are exclusively of tropical and subtropical rain forests. Greatest species diversities occur in these and other subgenera in the floristically most complex forests, declining with increasing altitude and latitude. The cosmopolitan members of the genus are rare in rain forests, otherwise suitable niches being, presumably, occupied.

D. (*Drosophila*) *persicae*, sp. nov., and *D.* (*Sophophora*) *ironensis*, sp. nov., are described, both collected in complex mesophyll vine forests. Of these *D. persicae* is one of only four non-cosmopolitan species of subgenus *Drosophila* in Australia, and apparently the only one entirely restricted to Australia. Apart from the cosmopolitan species *D. immigrans*, members of the subgenus *Drosophila* are not found south of north Queensland. Only two *Sophophora* species are common in more southern regions: one, *D. dispar*, extends across Victoria into temperate rain forests, while the other, *D. pseudotakahashii*, does not. Predictably, these two species are common in the depauperate highland habitats of north Queensland.

Introduction

The composition of the Australian *Drosophila* fauna was established from a survey of museum specimens (Bock 1976) and extensive field studies; the latter have dealt principally with the dominant Australian subgenus *Scaptodrosophila* in which there have been adaptive radiations throughout Australian rain forests (Bock and Parsons 1975; Parsons and Bock 1977, 1978), especially in the south. In north Queensland, the three other major *Drosophila* subgenera (*Hirtodrosophila*, *Sophophora* and *Drosophila* in order of species frequency) are also represented.

Drosophila species are most frequently collected in the wild by fermented fruit baiting, a technique successful for most Australian species of the subgenera *Drosophila* and *Sophophora*, but less so for species of the other subgenera. For the latter, techniques such as baiting with rotting mushrooms, aspirating off fungi, and sweeping off foliage, flowers and leaf litter may be successful. All techniques give different spectra of species in Queensland rain forests, which must relate to differences in resource utilization; thus species attracted to fruit baits are presumed to feed on and breed in the decaying fruits of rain-forest plants. The largest numbers of flies per unit time are usually obtained by fermented fruit baiting; in this paper we discuss the Queensland species collected by this method.

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World-wide, the subgenus *Drosophila* contains several hundred species, several quite widespread. However, of the four cosmopolitan species of this subgenus (*funebris*, *immigrans*, *hydei* and *repleta*), only *immigrans* has been detected (rarely) in Australian rain forests. Only members of the *immigrans* species-group of this subgenus (*sulfurigaster*, *rubida* and *pseudotetrachaeta*) have previously been recorded in Australian natural habitats, all restricted to north Queensland. Recently, however, a new species of the subgenus *Drosophila*, not a member of the *immigrans* group, has been detected at fruit baits in several north Queensland rain forests; it is described in the appendix.

Within the subgenus *Sophophora* a few more endemic species occur. Bock (1976) listed 10 members of the *melanogaster* species-group in Australia, principally in north Queensland. Of these, the cosmopolitans *melanogaster* and *simulans* are of urban and rural rather than natural habitats, while *ananassae* occasionally occurs in north Queensland rain forests. Others which are also found to the north of Australia are *serrata*, *birchii*, *pseudoananassae*, *denticulata* and *eugracilis*, while two species, *pseudotakahashii* (common) and *smithersi* (rare), are evidently endemic; all of the latter group of species with the exception of *eugracilis* have been detected during the course of the present work. In addition a new *melanogaster*-group species first found at Iron Range, Cape York Peninsula, has recently been collected; its description is provided in the appendix. Australia also possesses four other endemic *Sophophora* species with apparently no close relatives elsewhere: *dispar*, and three related species distinguished by highly unusual sex combs, *pinnitarsus*, *scopata* and *progastor*. *D. dispar* is widespread and attracted to fruit baits; the other three species are only occasionally baited.

Species of the subgenera *Hirtodrosophila* and *Scaptodrosophila* are rarely attracted to fruit baits. Only *D.* (*Scaptodrosophila*) *specensis* has been collected regularly by this method, although it is also attracted to mushroom baits. Other members of the same species-complex (*lativittata* and *enigma*) have been found in orchards of southern Australia. Remaining fruit bait records are all rare and sporadic and may be a result of the baits having been placed in microniches appropriate for other collection methods (e.g. leaf-litter species).

Collection Methods and Site Ecologies

Baiting was carried out at sites close to permanent water or moisture. Away from moist areas, especially in dry weather, the yield of flies is consistently low. Members of the genus *Drosophila* have been shown to be very sensitive to desiccation–high temperature stress (Parsons 1977), such that on sunny days flies are usually only found in cool damp shaded microniches, but if these points are borne in mind, collection yields can frequently be quite good.

The habitats can be subdivided according to rain-forest type. Webb (1968) classified Australian rain-forest vegetation into 20 structural types, many of which occur in the main region to be treated here—the humid tropics of north Queensland. The north Queensland rain forests are 'closed' and characterized by vines, the latter a feature of tropical–subtropical thermal regions; they are therefore quite different from the temperate forests further south where ferns are prominent, and not unexpectedly have quite a different *Drosophila* fauna (Parsons and Bock 1977, 1978).

Detailed maps have been published by Tracey and Webb (1975) for the humid tropics. Of their classification we consider in this paper:

(1) *Complex mesophyll vine forests*

(*a*) Very wet and wet lowlands and foothills (< 400 m altitude); basalts, basic volcanics, mixed colluvium on footslopes, and riverine alluvia. Six sites fit this category (Table 1, Fig. 1) although the most northerly site at Iron Range has tall monsoonal forest in addition.

(*b*) Very wet and wet cloudy uplands (400–800 m altitude); basalts.

(2) *Mesophyll vine forests*

(*a*) Very wet and wet lowlands and foothills; granites and schists.

(5) *Complex notophyll vine forests*

(*a*) Cloudy and wet highlands (800–1600 m altitude); basalt and basic rocks.

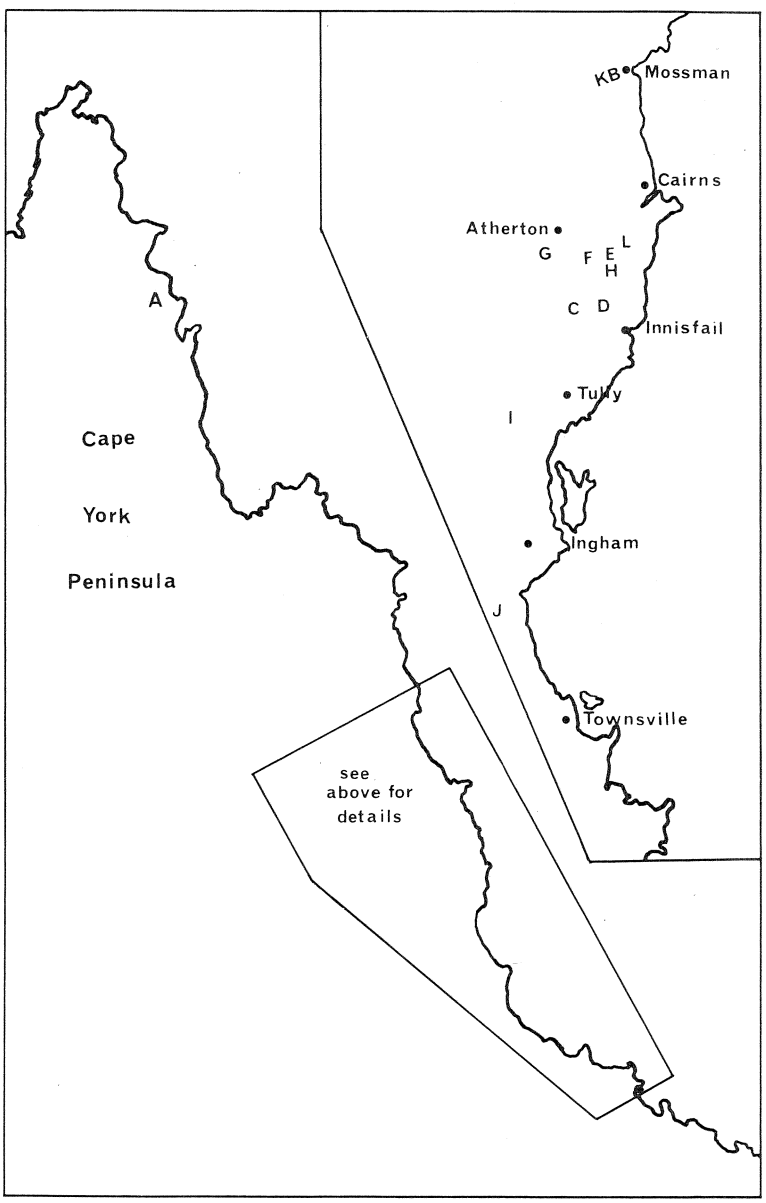

Fig. 1. Collection localities mentioned in the text and tables. **A**, Iron Range. **B**, Mossman Gorge. **C**, Palmerston National Park. **D**, Bartle Frere (Josephine Falls). **E**, **H**, Mulgrave Forestry Road. **F**, Lake Eacham. **G**, The Crater. **I**, Cardwell Ranges. **J**, Mt Spec. **K**, Mt Lewis. **L**, Mt Bellenden Ker.

(8) *Simple notophyll vine forest.* Cloudy wet moist uplands and highlands; granites, schists and volcanics.

(9) *Simple microphyll vine–fern forest.* Cloudy wet highlands; granites.

The forest growing on basalts are 1*a*, 1*b* and 5*a* as an altitudinal sequence; those on granites, schists etc. are 2*a*, 8 and 9. Forest types 1*a* and 2*a* frequently intergrade into each other over short distances and the depauperate nature of 2*a* compared with 1*a* forests for *Drosophila* fauna has already been noted (Bock and Parsons 1977); since *Drosophila* species depend on microbial degradation products involving plant materials (Throckmorton 1975) this is to be expected.

The south Queensland rain forests are subtropical and, while they have analogies with some of the above categories (Webb, personal communication), their subdivisions are not considered here because, as will be shown, the diversities of *Drosophila* species are low and similar throughout these forests.

At all collection sites, mushroom baiting was carried out to obtain comparative data on bait effectiveness. Where possible sweeping was also carried out (a procedure clearly impossible in very wet weather).

Table 1. Records of subgenus *Drosophila* in north Queensland

The triple entries refer to flies collected by fermented fruit baiting, mushroom baiting and sweeping respectively. For key to localities, see Fig. 1

Forest type	Locality	*immigrans*	*sulfurigaster*	*rubida*	*pseudotetrachaeta*	*persicae*
1*a*	A	—	9, 4, 0	1, 1, 0	0, 3, 0	15, 0, 0
	B	—	258, 9, 0	82, 6, 0	0, 6, 0	—
	C	—	4, 0, 0	53, 2, 0	0, 1, 0	—
	D	—	31, 5, 0	27, 10, 1	2, 5, 0	5, 0, 0
	E	2, 0, 0	2, 0, 0	9, 1, 0	8, 2, 3	4, 0, 0
1*b*	F	3, 1, 0	14, 0, 0	17, 2, 0	2, 1, 0	—
5*a*	G	—	15, 1, 0	6, 3, 0	—	—
2*a*	H	—	—	1, 0, 0	—	1, 0 ,0
8	I	—	2, 0, 0	1, 0, 0	—	—
	J	—	1, 2, 0	—	—	—
9	K	—	—	—	—	—
	L	—	—	—	—	—

Results

The data are given by locality (Fig. 1) in Table 1 (subgenus *Drosophila*), Table 2 (subgenus *Sophophora*) and Table 3 (subgenera *Hirtodrosophila* and *Scaptodrosophila*) in north Queensland, and summed for south Queensland in Table 4. Since the rain forests of northern New South Wales are similar in many respects to those of southern Queensland, data for the former are also included in Table 4. Species collected principally by fruit baiting have also been taken occasionally at random baits or by sweeping foliage; these results are also included.

Apart from *D. immigrans* (cf. comments in Introduction), it is evident that at least three of the four remaining species of the subgenus *Drosophila* occur in all 1*a* forests and in the 1*b* forest, the latter an upland version of the former. In the highland version (5*a*) only two species of this subgenus are found. Thus in the rain forests of basaltic soils, species diversities fall with increasing altitude as expected on normal zoogeographic grounds. The granite–schist forests (2*a*, 8) are generally depauperate by comparison; the one *D. persicae* in the Mulgrave Forestry Road 2*a* forest may well be due to the proximity of 1*a* forest in this region. Finally, in the most depauperate

Table 2. Records of subgenus *Sophophora* in north Queensland

The triple entries refer to flies collected by fermented fruit baiting, mushroom baiting and sweeping respectively. For key to localities, see Fig. 1

Forest type	Locality	*pseudotakahashii*	*serrata*	*birchii*	*pseudoananassae*	*denticulata*	*ironensis*	*dispar*	Other species	No. of species
1*a*	A	—	—	1, 0, 0	1, 0, 0	1, 0, 0	7, 0, 0	—	*ananassae* 18, 0, 0 *bipectinata* 1, 0, 0	6
	B	17, 1, 0	1, 8, 0	15, 16, 0	1, 0, 0	1, 2, 0	112, 0, 0	—	*simulans* 1, 0, 0	7
	C	103, 0, 0	3, 0, 0	24, 0, 0	—	3, 2, 2	—	—	*pinnitarsus* 0, 0, 1 *scopata* 0, 0, 1 *progastor* 1, 9, 3	7
	D	12, 2, 3	—	22, 9, 0	103, 0, 0	1, 4, 0	—	—	*scopata* 2, 0, 0	6
	E	58, 3, 0	1, 0, 0	12, 2, 0	—	1, 0, 0	—	—	*pinnitarsus* 0, 0, 9 *scopata* 0, 2, 2	6
1*b*	F	72, 1, 1	—	14, 2, 0	—	—	12, 0, 0	—	*smithersi* 0, 2, 0 *pinnitarsus* 0, 0, 1 *scopata* 0, 0, 1 *progastor* 0, 3, 0	7
5*a*	G	49, 1, 0	0, 3, 0	1, 1, 0	5, 0, 0	—	—	1, 2, 0	—	5
2*a*	H	31, 1, 0	—	0, 2, 0	—	—	—	—	—	2
8	I	31, 0, 0	—	2, 0, 0	—	—	—	12, 0, 0	—	3
	J	16, 2, 0	—	—	—	—	—	0, 2, 0	—	2
9	K	30, 0, 0	—	—	—	—	—	62, 15, 1	—	2
	L	33, 0, 6	—	2, 0, 0	—	—	—	109, 19, 25	—	2

highland forests (9) species of the subgenus *Drosophila* are absent. Within the subgenus *Drosophila* species diversity thus falls with altitude, more rapidly in the depauperate forests on granites and schists. Further south, only one species was found at Mt Spec, a relatively depauperate forest. In south Queensland, except for the cosmopolitan *D. immigrans*, the subgenus *Drosophila* is absent (Table 4).

Results for the subgenus *Sophophora* (Table 2) are broadly similar. For basaltic type soils, in the 1*a* forests six or seven species were found, and in the 1*b* and 5*a* forests seven and five species respectively. For the granite–schist forests usually two species were found, as is the situation (Table 4) for south Queensland (and northern New South Wales). The common *D. pseudotakahashii* occurs at all sites except Iron Range, a finding strongly suggesting that the species is an Australian endemic rather than a member of the larger group of species which also occur in New Guinea.

Table 3. Records of subgenera *Scaptodrosophila* and *Hirtodrosophila* in north Queensland

The triple entries refer to flies collected by fermented fruit baiting, mushroom baiting and sweeping respectively. For key to localities, see Fig. 1. An entry of a species at a given locality depends on at least one fruit-baited fly being collected

Forest type	Locality	*Scaptodrosophila*		*Hirtodrosophila*
		specensis	Other species	
1*a*	A	—	*bryani* 11, 0, 0; *novoguinensis* 1, 0, 0	—
	C	4, 0, 0	—	—
	D	3, 7, 0	*eluta* 2, 2, 0	—
	E	—	*altera* 1, 0, 0; *cancellata* 1, 0, 0 *novoguinensis* 3, 0, 0; *rhipister* 2, 12, 0	sp. nov. 1, 0, 3
1*b*	F	1, 0, 0	—	*zentae* 2, 2, 9
5*a*	G	18, 7, 0	—	—
8	I	3, 6, 0	—	*zentae* 7, 1, 159
	J	1, 14, 0	—	*zentae* 2, 0, 25
9	L	2, 0, 1	—	—

The rare *D. smithersi* was only found at Lake Eacham; this, with the isolated previous records for this species (Bock 1976), suggests that it may be a Queensland endemic, a similar species occurring in New Guinea (Bock and Wheeler 1972). Of those species known to occur to the north of Australia, *denticulata* is clearly a species of 1*a* forests; *serrata*, at least in north Queensland, is a species of forests on basaltic soils, while its sibling *birchii* is more widespread, occurring in forests on granitic soils in the humid tropics. *D. pseudoananassae* is a further basaltic soil species. Two other *melanogaster*-group species, the cosmopolitan *ananassae* and *simulans*, are rare in the rain forests, *simulans* known from a single individual only. *D. ironensis* is known from three basaltic sites; particularly high numbers were found at Mossman Gorge, and its southernmost recorded distribution is Lake Eacham.

D. dispar is not closely related to any other sophophoran species and its distribution is also unique, appearing to be the converse of those mainly found on basaltic soils. Indeed it was found in greatest numbers in forest type 9, i.e. a simple microphyll vine–fern forest on the granites of cloudy wet highlands, and it is widespread in southern Queensland. Bock (1976) recorded its distribution as far south as Victoria; in the southernmost parts of its range it is an inhabitant of undisturbed tree-fern and sedge habitats where it commonly occurs in association with various southern *Scaptodrosophila* species of the *inornata* group (Parsons and Bock 1977). The most

northerly recorded occurrence of an *inornata* species-group member is that of *obsoleta* from the summit of Mt Bellenden Ker, where *dispar* is extremely common (Parsons and Bock 1978). In addition, in southern Queensland the *inornata*-group species *collessi* and *inornata* occur with *dispar*, as is so in a number of Victorian sites (Parsons and Bock 1977). Ecologically, therefore, *dispar* has more in common with the *inornata*-group species than with any other sophophoran species; it is the only sophophoran species found in temperate zone rain forests. The Mt Lewis and Bellenden Ker *dispar* records show the species to be collected readily by the three major methods, i.e. fermented fruit baiting, mushroom baiting and sweeping, although far more readily by the first. However, in Victoria, *dispar* has been obtained only by sweeping, except in the extreme east of the state where all three methods are successful. Parsons and Bock (1977) therefore suggested some population differentiation within the species. Given that it can be cultured (albeit not easily) in the laboratory, it therefore offers the possibility of detailed evolutionary studies relating to the genetic basis of resource utilization, and, more generally, the basis of its adaptation to a variety of habitats from Victoria to north Queensland.

Table 4. Records from southern Queensland and northern New South Wales

The triple entries refer to flies collected by fermented fruit baiting, mushroom baiting and sweeping respectively. An entry under *Scaptodrosophila* depends on at least one fruit-baited fly having been collected

Subgenus and species	Southern Queensland	Northern New South Wales
Drosophila		
immigrans	7, 0, 0	1, 0, 0
Sophophora		
pseudotakahashii	80, 7, 24[A]	127, 1, 0
serrata	17, 7, 0	0, 1, 0
dispar	3, 2, 0	0, 1, 0
Scaptodrosophila		
specensis	24, 60, 0	7, 10, 0
metaxa	1, 2, 90	—
Localities	Rain forests near Noosa Heads, in Mapleton Falls, Mt Glorious, Joalah, Cunninghams Gap and Lamington Plateau National Parks, and near Bilambil	Rain forests in Bruxner Park near Coffs Harbour and Dorrigo National Park

[A] Swept from the vicinity of fruits on the ground.

Three of the other species listed in Table 2, *serrata*, *birchii* and *denticulata*, are reasonably common at mushroom baits, again suggesting possible differences in resource utilization compared with the remaining species; the same finding applies to *pseudotetrachaeta* and (to a minor extent) *rubida* of the subgenus *Drosophila* (Table 1).

Of the remaining *Sophophora* species listed in Table 2, *D. bipectinata* is very common in south-east Asia and New Guinea, but its Iron Range record is the only Australian record in a natural habitat. Three apparently endemic species, *pinnitarsus*, *scopata* and *progastor*, are rarely collected by fruit baiting, suggesting an ecological divergence in agreement with their taxonomic divergence from other *Sophophora* species, i.e. although they occur mainly in 1*a* forests they occupy a different niche or niches from those of the baited species.

In Table 3, records of species in the subgenera *Scaptodrosophila* and *Hirtodrosophila* that have been collected at fermented fruit baits are given. The commonest is *D.* (*Scaptodrosophila*) *specensis*, which has some similarities in distribution with *pseudotakahashii* in being rather rare in 1*a* forests but common on depauperate, south Queensland and northern New South Wales forests; it is also attracted to mushroom baits. The baitable *D.* (*Scaptodrosophila*) *bryani*, known from Pacific regions, was found at Iron Range. The remaining *Scaptodrosophila* species are rare and without exception are of 1*a* forests. At least two of them, *eluta* and *rhipister*, were probably fortuitously at fermented fruit baits, since they are taken at mushroom baits in large numbers (unpublished data). An undescribed *Hirtodrosophila* species was found at fruit baits in a 1*a* forest, again probably fortuitously since most specimens of this species were swept from foliage. Finally *D.* (*Hirtodrosophila*) *zentae*, a common species of depauperate north Queensland forests, has been collected extensively by sweeping. Irrespective of resources utilized, the rare species are mainly of diverse 1*a* forests.

Discussion

The contrast between the species compositions of northern and southern Australia (Parsons and Bock 1977, 1978) is dramatic (unpublished data for the *Drosophila* faunas collected by other methods suggest the same situation). The only fruit-baited species common to north and south is *D. dispar*, a species of depauperate northern regions, and given that *dispar* is the only species known in Australia that can be collected in large numbers in the north by the three major collection methods, its wide success can perhaps be attributed to its ability to exploit a wide variety of niches. The species listed above are thus all of tropical and subtropical rain forests, except for *D. dispar* which extends into forests of the temperate zone. Interestingly, *dispar* is not attracted to baits in the southernmost part of its range where it must be collected by sweeping.

The two new species described in the Appendix are both of the floristically most complex 1*a* forests. Generally, the ecological niches represented by successful fermented fruit baiting give the greatest species diversities in such forests, presumably because of the high diversity of decaying plant materials therein. In north Queensland, species diversities fall as forests become more depauperate either on poorer soil, at higher altitudes or both. As well, species diversities fall towards the south. Not unexpectedly, the *Drosophila* faunas of highland north Queensland have analogies with those of south Queensland and regions further south.

The depauperate composition of the subgenus *Drosophila* emphasizes the unique nature of the Australian *Drosophila* fauna since (except for the cosmopolitans) only four species are known; one, *D. persicae*, is apparently restricted to Australia. Although there are a few records of *D. immigrans* in rain forests (Table 1) it is generally found in urban and orchard regions (McKenzie and Parsons 1974); however, it has been recorded in rich Chilean rain forests (Brncic 1970). Similarly, for the cosmopolitan species of the subgenus *Sophophora*, *D. melanogaster* is not represented amongst the records of Table 2, and its sibling species *D. simulans* only once. It may be relevant that in Brazil, the latter, but not the former, species is occasionally abundant away from human habitation (Dobzhansky and Pavan 1950). The remaining cosmopolitan species collected in natural habitats, *D. ananassae*, is unknown

on the Australian mainland south of Rockhampton in central Queensland. In general, the cosmopolitan species of the genus *Drosophila* are rare or absent in Australian natural habitats.

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Appendix: Descriptions of *D. persicae*, sp. nov., and *D. ironensis*, sp. nov.

The two new species recovered in the collections discussed above are described below in the form used previously for the Australian *Drosophila* species (Bock 1976).

Drosophila (Drosophila) persicae, sp. nov.

Types

Holotype ♂: Iron Range, north Queensland, 30.iv.1976, fruit bait (peaches), I.R. Bock. Paratypes: 2 ♂, 10 ♀, same data as holotype. All specimens deposited in ANIC.

Distinguishing Features

Body mid–dark brown. Carina very large. Cheek broad, with long bristles in posterior corner. Only 2 sternopleural bristles present in addition to microchaetae.

Description

Body length. 3·3 mm (holotype); 3·1–3·7 mm (paratype range).

Head. Arista large, with 5–6 branches above and 2–3 below plus terminal fork. Front 1·4 times broader than long, tan; periorbits slightly silvery, darkened in some specimens; ocellar triangle silvery, darkened; 2nd antennal segments tan; 3rd tan, slightly dusky anteriorly. Carina very large, broader below, lower margin curved; shallow median sulcus present in carina of most specimens. Cheek slightly curved; greatest width 0·25 times greatest diameter of eye; posterior corner of cheek with 3 very long bristles in addition to smaller ones. Two vibrissae present (1 in a few specimens) plus row of shorter bristles along cheek. Eyes with dense fine pile. Orbital bristles in ratio 3 : 2 : 5; anterior reclinate orbital posteriolateral to procinate orbital.

Thorax. Mesonotum and scutellum mid to dark chocolatey brown; pleura slightly paler. Acrostichal hairs in 6 rows in front of dorsocentral bristles, 4 rows between dorsocentrals. Ratio anterior : posterior dorsocentrals 0·6. Sterno-index 0·75. Middle sternopleural bristle absent. Legs somewhat paler than thorax; no sexual dimorphism in forelegs. Preapical bristles on all tibiae; apicals on 1st and 2nd tibiae.

Wings. Faintly brown (darker in darker specimens). *C*-index, 2·2; 4*V*-index, 2·0; 5*X*-index, 1·3; *M*-index, 0·5. 3rd costal section with heavy setation on basal 0·8. Length 3·0 mm. (All measurements from holotype.)

Abdomen. Mid–dark brown, in a few specimens with darker posterior bands not interrupted in midline.

Male genitalia (Figs 2, 3). External genitalia micropubescent; lower margin of genital arch, and clasper, with numerous strong black teeth. Aedeagus cylindrical, curved.

Female genitalia. Egg guides narrowly rounded apically, with few short teeth.

Distribution

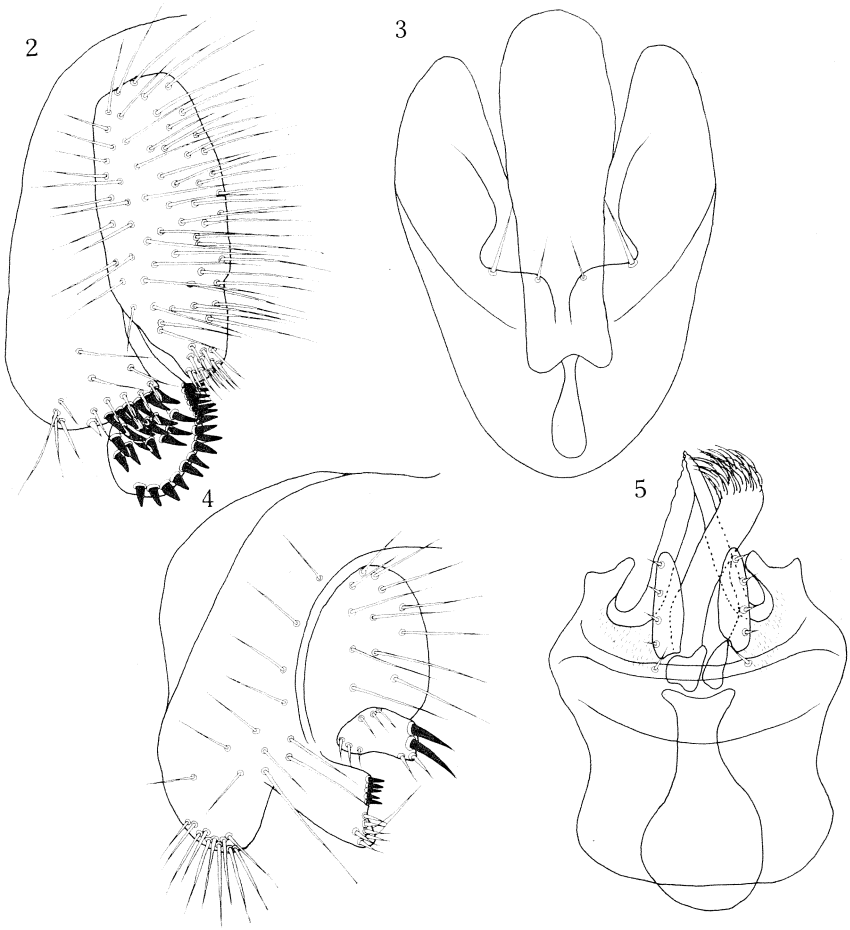
As recorded above in Table 1 and Fig. 1.

Relationships

D. persicae is a member of the subgenus *Drosophila*. The only other members of this subgenus (apart from the cosmopolitans discussed above) occurring in Australia are members of the *immigrans* species-group; many other species of the *immigrans* group occur in south-east Asia, where the group evidently originated. *D. persicae* is clearly not a member of the *immigrans* group (members of which are distinguished by possession of a row of short stout setulae on each fore femur). In the structure of the male genitalia the species shows some resemblance to *D. funebris*, but differs from members of the *funebris* group in several details.

Numerous species-groups have been recognized within the subgenus *Drosophila*, while many species remain as yet ungrouped; *D. persicae* is here assigned to the latter category. The species keys to 7 in Bock's (1976) key to Australian species of *Drosophila*, but fits neither alternative in that couplet. It is, perhaps, noteworthy

that the abdominal bands in *persicae* (when evident) are not interrupted in the midline. Members of the subgenus *Drosophila* are frequently stated to possess interrupted abdominal bands, but this characteristic is not universal: the well known and widespread *D. sulfurigaster* possesses uninterrupted bands, while its near relative *D. immigrans* has interrupted bands; several other closely related species possess unbanded abdomens.



Figs 2 and 3. *D. persicae*, sp. nov.: *2*, male external genitalia; *3*, male internal genitalia.
Figs 4 and 5. *D. ironensis*, sp. nov.: *4*, male external genitalia; *5*, male internal genitalia.

Special Comments

Although attracted to fruit baits, *D. persicae* is clearly not easily culturable. All of the paratype females were kept in individual tubes of standard cornmeal culture medium after their collection until their death, when they were pinned. In most cases, some evidence of larval activity in the culture medium could be seen within a week, indicating that the females had been inseminated in the wild, but in only one tube were pupae obtained (the other larvae having died before reaching their final instar), and only two flies emerged from a total of about six pupae; both died within days.

***Drosophila* (*Sophophora*) *ironensis*,** sp. nov.

Types

Holotype ♂: ex iso-female culture, Iron Range, north Queensland, 29.iv.1976, fruit bait, I. R. Bock. Paratypes: 5 ♂, 5 ♀, same data as holotype. All specimens deposited in ANIC.

Distinguishing Features

Small species. Sex-comb absent in male. Body pale yellowish; abdominal tergites with weak posterior bands. *C*-index low. Carina strong.

Description

Body length. 2·05 mm (holotype); 2·0–2·4 mm (paratype range).

Head. Arista large, with 4 straight branches above and 3 straight branches below plus large terminal fork. Front 1·3 times broader than long, pale yellowish tan. Periorbits concolorous with front, slightly silvery about bases of orbital bristles. Ocellar triangle slightly silvery, slightly darkened posteriorly. Occiput pale tan. 2nd and 3rd antennal segments tan. Carina prominent, nose-like, rather flat, smoothly rounded below. Cheek slightly curved, greatest width 0·1 times greatest diameter of eye. Eyes with dense fine pile. Orbital bristles in ratio 3 : 1 : 3; anterior reclinate orbital posterolateral to proclinate orbital.

Thorax. Uniformly tan. Acrostichal hairs in 6 rows in front of dorsocentral bristles, 4 rows between dorsocentrals. Ratio anterior : posterior dorsocentrals 0·5. Sterno-index 0·5. Anterior scutellar bristles 0·8 length of apicals, convergent. Legs tan; no sexual dimorphism in forelegs. Preapical bristles on all tibiae; apicals on 2nd tibiae only.

Wings. Hyaline. *C*-index, 1·6; 4*V*-index, 2·5; 5*X*-index, 2·2; *M*-index, 0·8. 3rd costal section with heavy setation on basal 0·45. Length 1·75 mm. (All measurements from holotype.)

Abdomen. All tergites pale yellowish tan, with narrow pale posterior bands not interrupted in midline; no sexual dimorphism in abdominal coloration.

Male genitalia (Figs 4, 5). Primary and secondary claspers present in external genitalia, secondary with 2 large teeth. Aedeagus with strong apical pubescence.

Female genitalia. Egg guides small, narrowly rounded apically, with row of fine marginal teeth.

Distribution

As recorded above in Table 2 and Fig. 1.

Relationships

D. ironensis is a member of the *melanogaster* species-group. It is highly unusual within that group in lacking a sex-comb; only two other *melanogaster*-group species without sex-combs are known (from a total of over 70), *tristipennis* and *lucipennis*, both in the *suzukii* subgroup; a third species, *apectinata*, also lacking a sex-comb, has been considered a possible member of the *melanogaster* group (Bock and Wheeler

1972). The structure of the male genitalia of *ironensis* places it in the *ananassae* subgroup. The species keys to 18 in Bock's (1976) key, but does not fit either alternative in the couplet.

Special Comments

D. ironensis cultures with difficulty on standard cornmeal medium.

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