

# Collection and Export of Australian Insects

## An analysis of legislative protection and trade to Europe

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*The Australian insect fauna is poorly known biologically and taxonomically. This is largely because of the hitherto small-scale collection of insects in that country, compared with that which exists in the USA and Europe. In the past, this has resulted in the insect fauna being more or less overlooked by international insect traders. In recent years, however, there has been an escalation of interest, such that trade in some species may need to be more closely monitored.*

### INTRODUCTION

From the late 1700s to the early 1900s, virtually the only people seriously interested in the study and collection of Australian insects were European entomologists. They generally employed small teams of collectors to visit Australia to undertake random collecting. Usually only relatively small numbers of the most common and widespread species were collected, with a preference for large, showy species, as these are often commercially appealing. Collection was limited by the highly seasonal and erratic appearance (at least in the adult stage) of many species of the Australian insect fauna and by the inaccessibility of much of Australia's bushland.

After World War I, the emphasis in describing and collecting Australian insects shifted from Europe to Australia, where serious interest in the native insect fauna was fostered largely by a few dedicated entomologists. The publication of a number of popular books on insects and the development and expansion of natural history organisations were also instrumental in the promotion of insect collecting. The sale of specimens overseas, however, was virtually non-existent.

There was an escalation of interest in collecting Australian insects during the late 1950s and early 1960s. Around this time a number of amateur collectors began to gain prominence in entomological circles and were being approached by overseas collectors, entomologists and institutions for supplies of Australian insects. Most of the insects collected by these amateur collectors were traded or swapped. Some, especially those going to private collectors and professional entomologists (both overseas and within Australia), were sold for moderate sums. However, the amount of collecting and trade undertaken by these amateur entomologists was small, particularly when compared to the level of collecting activity undertaken by overseas institutions on official collecting trips (Monteith, *in litt.*, 2 April 1990).

On a global level, Australian insects do not appear to attract the same attention as species from tropical areas such as South America, Southeast Asia and the various Pacific islands. Amongst insect collectors throughout the world most interest is shown in the Lepidoptera, in particular the birdwing butterflies and other Papilionidae. Although Australia possesses some 370 species of butterflies, most of these are small and not very striking. Most of the large tropical species from north Queensland are also found in Papua New Guinea and/or Southeast Asia, or have closely related subspecies in these places which are of more interest to dealers and collectors.

The main, openly-traded species of Australian insect appear to be members of the order Coleoptera and, in particular, the colourful members of the family Buprestidae (jewel beetles). These beetles often occur in large numbers in the same locality and are thus easier to collect than butterflies and many other insects. Beetles are also popular with those dealing overseas because of the comparative ease with which they can be packaged, preserved and despatched.

Until the proclamation of the Federal *Wildlife Protection (Regulation of Exports & Imports) Act 1982* (WPA), in May 1984, little attention was directed towards individuals who were openly collecting and selling insects overseas. Despite Federal laws prohibiting export, and State laws prohibiting collection of certain insect species (see below), there is still a moderately active export trade in wild-collected Australian insects. The majority of this material appears to originate from northeast Queensland and southwest Western Australia. It appears that the trade in some insect groups - for example jewel beetles - has increased dramatically during the past few years.

### CONTROL OF INSECT COLLECTION AND EXPORT

There seems to be a certain degree of controversy and dissent over the benefits of specific legal protection for insects (see Hill & Michaelis (1988) for a summary of this debate). Legal protection is probably of limited value while there are no regulations governing non-protected areas to prevent the destruction of the natural habitat, so crucial to the survival of the insects. On the other hand, it could be argued that listing insect species as protected is at least recognition that they require some form of management.

### CITES

The only Australian insect species currently listed in the Appendices of CITES belong to the genus *Ornithoptera* (birdwing butterflies). All members of this genus are listed in CITES Appendix II, apart from Queen Alexandra's Birdwing *O. alexandrae* which is listed in Appendix I. Common & Waterhouse (1981) recognise two Australian species of Ornithoptera: *O. richmondia* in the south and *O. priamus* in the north. Four separate subspecies of the latter occur within Australian territory, viz., *O.p. poseidon*, *O.p. pronomus*, *O.p. macalpinei* and *O.p. euphorion*.



*Ornithoptera priamus poseidon* Female and male undersides

### Federal

Federal control of insect export first occurred in 1973 (Monteith, 1987). At this time, 'live or dead insects (including ticks and spiders)' were added to the list of prohibited exports under the *Customs Act 1901*. The relevant regulation (Reg. 13A) was administered under a set of guidelines formulated by the Department of Science. It was a controversial regulation, and suggestions were made that it "... had no conservation motive but was solely aimed at preventing the deposition of holotypes of Australian insects in overseas institutions" (Monteith, 1987 p.21). Reg. 13A was amended a number of times before the introduction of the WPA, after which it was rescinded.

Broadly, the WPA regulates international trade in all CITES-listed species, all live animals and plants, and all native fauna and flora. However, certain taxa, listed on Schedules 4-6 of the Act, are exempt from control. Any native invertebrates which are exempt from export controls are listed on Schedule 4. A permit is required to export any native insects. Permits are only granted if the export is: an inter-zoological transfer; for the purposes of scientific research; of a captive-bred specimen; or of a specimen taken in accordance with an approved management programme. To date (December 1991), there are no approved management programmes for insects. Therefore all commercial exports of insects must be of captive-bred specimens. (There are two butterfly farms in Australia which legally export captive-bred butterflies.) In early 1987, the WPA was amended to allow the export of certain live (native Australian) invertebrate material. Prior to this, permits could only be issued for the export of dead material.

Table 1 shows details of all legal exports under the WPA (from 1984-1987) for any genera identified in this report as being available on overseas commercial markets. It indicates that none of the beetle or moth (Saturniidae) species identified in this report has been subject to legal trade since 1 May 1984. All the birdwing butterfly taxa have been traded legally, but none of this

trade has gone directly to Germany, the location of all the dealers advertising these taxa (Table 2).

### State and Territory

**Queensland:** All 'fauna' is protected under the *Fauna Conservation Act 1974-1989*. However 'fauna' is defined as indigenous birds and mammals only, plus other species of an animal specifically declared to be fauna by government decree. Priam's Birdwing *Ornithoptera priamus* and Ulysses Butterfly *Papilio ulysses* were declared to be fauna under the Act in 1974. Under the Act it is an offence to take, keep, buy or sell fauna without a permit. Both of these butterfly species are subject to trade.

On 21 July 1990, the Illidge's Ant-blue Butterfly *Acrodipsas illidgei* was declared to be, not only fauna, but Permanently Protected Fauna (the first invertebrate to be placed in this specially protected category). Particularly strict regulations and penalties apply to Permanently Protected Fauna which effectively make it very difficult to take or keep specimens of species listed in this category.

In addition, all invertebrates are fully protected in National Parks, Environmental Parks, State Forests and Timber Reserves throughout Queensland.

**Tasmania:** The following invertebrates are declared as wholly protected wildlife under *Wildlife Regulations 1971* of the *National Parks & Wildlife Act 1970*:

Beetles	- <i>Idacarabus</i> spp., <i>Geodetrechus mendumae</i> , <i>G. parallelus</i> , <i>Tasmanotrechus cockerilli</i> ;
Cave Crickets	- <i>Micropathus</i> spp., <i>Cavernotettix</i> spp., <i>Parvotettix</i> spp.;
Glow-worm	- <i>Arachnocampa tasmaniensis</i> ;
Harvestman	- <i>Monoxomyia</i> spp., <i>Lomanella</i> spp.;
Pseudoscorpions	- <i>Pseudotyranochthonius typhlus</i> , <i>P. tasmanicus</i> .

Under these regulations, wholly protected wildlife cannot be taken, kept, bought or sold without a permit. None of these species has been identified in this report as being subject to trade.

All other species of insects are also considered to be wildlife under the Act. It is an offence to remove wildlife from Tasmania without a permit.

**Victoria:** Any invertebrate can be nominated for specific protection under the *Flora & Fauna Guarantee Act 1988*. Several species of butterfly have already been nominated under the Act (New, *in litt.*, 2 January 1990). However the Regulations to enforce this Act are not yet in place. Additionally, collection of insects in National Parks within Victoria is also prohibited without a permit.

**Western Australia:** Jewel beetles (family Buprestidae) and ants of the genus *Nothomyrmecia* were declared protected fauna under the *Wildlife Conservation Act* ▷

Collection and Export of Australian Insects

Species	Year	Country of Import	No.	Description
<i>Antheraea janetta</i>	1985	Colombia	20	Bodies
	1987	France	2	Bodies
	1987	UK	100	Inverts
<i>Antheraea rhythmica</i>	1985	Colombia	40	Bodies
<i>Ornithoptera priamus</i>	1985	Colombia	3	Bodies
	1985	Colombia	10	Eggs
	1985	Colombia	10	Larvae
	1985	Colombia	2	Pupae
<i>Ornithoptera priamus euphorion</i>	1984	Japan	30	Bodies
	1985	Japan	34	Bodies
	1986	Japan	65	Bodies
	1987	France	6	Bodies
	1987	USA	1	Body
	1987	USA	12	Larvae
<i>Ornithoptera priamus macalpinei</i>	1985	Japan	20	Bodies
	1986	Japan	10	Bodies
	1987	France	26	Bodies
	1987	USA	6	Bodies
<i>Ornithoptera richmondia</i>	1985	Colombia	10	Bodies
	1985	Japan	8	Bodies
	1986	Japan	2	Bodies
	1987	France	40	Bodies
	1987	USA	16	Bodies
	1987	USA	30	Cases
<i>Priamus euphorion*</i>	1985	Japan	20	Bodies
<i>Priamus macalpinei*</i>	1985	Japan	40	Bodies
<i>Graphium agamemnon</i>	1985	Japan	5	Bodies
	1987	UK	2	Bodies
<i>Graphium eurypylus</i>	1987	UK	1	Body
<i>Graphium macleayanum</i>	1985	Colombia	10	Bodies
	1985	Japan	3	Bodies
	1987	UK	1	Body
<i>Graphium sarpedon</i>	1987	UK	1	Body
<i>Papilio aegeus</i>	1985	Colombia	30	Bodies
	1985	Colombia	10	Larvae
	1985	Colombia	10	Pupae
	1985	UK	550	Live
	1987	France	2	Bodies
	1987	UK	2	Bodies
<i>Papilio aegeus aegeus</i>	1985	Japan	15	Bodies
	1985	USA	10	Bodies
	1987	UK	500	Inverts
<i>Papilio aegeus aegeus f. beatrix</i>	1985	Japan	10	Bodies
<i>Papilio ambrax</i>	1986	Japan	40	Bodies
	1987	France	2	Bodies
	1987	UK	2	Bodies
<i>Papilio anactus</i>	1985	Colombia	20	Bodies
	1985	UK	60	Live
	1987	UK	1	Body
<i>Papilio canopus</i>	1985	Colombia	10	Pupae
	1987	France	2	Bodies
	1987	UK	2	Bodies
<i>Papilio ulysses</i>	1985	Colombia	10	Larvae
	1986	Japan	10	Bodies
<i>Papilio ulysses joesa</i>	1984	Japan	20	Bodies
	1987	France	2	Bodies

Table 1. No. of permits issued for exports of Lepidoptera (*Antheraea*, *Ornithoptera*, *Graphium* and *Papilio*), 1984-1987. Scientific names are as shown in the ANPWS statistics. In some cases these are not the recognised names. \* = *Ornithoptera priamus* Source: ANPWS unpublished statistics

▷ 1950-1980 on 1 August 1978. Protected fauna may not be taken, kept or traded without an appropriate permit. They may only be taken under authority issued in accordance with the *Wildlife Conservation Act*. Furthermore, all terrestrial invertebrates are protected in Nature Reserves and National Parks and, possibly, in State Forests and Timber Reserves, although this would appear to be subject to a broad legal interpretation of the *Conservation and Land Management Act 1984* (Morrison, *in litt.*, 20 July 1990).

**Other States and Territories:** In New South Wales, South Australia, Northern Territory and Australian Capital Territory insects are not considered to be protected fauna. However in all States and Territories except the Australian Capital Territory, insects are protected in conservation reserves such as National Parks. Collecting in these areas without a permit is illegal.

## TRADE

Information on Australian insect species traded overseas was gathered by examining French trade catalogues, and advertisements in the German entomological publication *Entomologische Zeitschrift* which carries a large number of advertisements from European collectors and traders. Full details of species traded and their prices are shown in Table 2. Comparison of Tables 1 and 2 shows that the only species advertised overseas which have been subject to legal export from Australia are members of the Papilionidae.

### Lepidoptera

All of the moth and butterfly species identified in this report as being subject to trade are capable of being captive-bred. This means material advertised in Europe has a number of possible sources: wild-collected specimens; bred in Australia; bred overseas; or, from an Australian or overseas private collection.

Four species of the family Papilionidae were identified in trade. *Ornithoptera priamus euphorion* is the largest and one of the most striking of the Australian butterflies. It has long been traded overseas. Richmond's Birdwing *Ornithoptera richmondia* is much rarer, with a more restricted distribution than *O.p. euphorion*. Little is known of its biology and habitat requirements. *Papilio (Graphium) macleayanum* is a common species with a distribution covering four Australian States. It is probably not in high demand with collectors. *Papilio ulysses joesa* is well known in Australia from its extensive representation on Queensland tourist logos and brochures. It is difficult to collect in the field and specimens are easily damaged. Almost all specimens in trade would be bred in captivity (not necessarily legally) (Monteith, *in litt.*, 2 April 1990). The Australian subspecies is now probably not in high demand since the Southeast Asian and Papua New Guinean subspecies appear to be easier and cheaper to obtain.

Two species of the moth family, Saturniidae, were

identified in European trade. The spectacular Hercules Moth *Coscinocera hercules* of Australia and Papua New Guinea, is the largest known Australian moth. Most of the material offered for sale in Europe appears to have been collected in Papua New Guinea and trade from Australia (at least in the adults) seems rather limited. *Antheraea eucalypti* is a large yellow, pink and/or pale brownish moth with prominent 'eye-spots' on the wings. Trade in this species has primarily been in the egg and cocoon stages. It appears that the congeneric *A. helena* is also sometimes traded, incorrectly labelled as *A. eucalypti* (New, *in litt.*, 2 January 1990). None of these species is threatened by collecting.

### Coleoptera, Buprestidae

At least 59 species of Australian Buprestidae have been offered for sale on the open market in Europe during the past decade, most within the past few years. This is clearly the largest number of species of any Australian insect family traded overseas. They are mostly large and attractive species, easily captured and packaged and can command relatively high prices. For example, *Stigmodera miranda* and *S. mniszewski* fetch A\$15-A\$49 (US\$10-US\$35) and A\$16-A\$57 respectively per specimen.

A majority of the 59 species are endemic to Western Australia, occurring in the arid and semi-arid south-west portion of the State. The remainder are also found in, but not restricted to, Western Australia. A number of these species are large and colourful - *S. bonvouloiri*, *S. brucki*, *S. cancellata*, *S. caroli*, *S. chalcodera*, for example. In general, the larger, more colourful species fetch higher prices than the small species such as *S. mustelamajor*, *S. picta*, *S. placens*, *S. subtinca*.

Buprestids are not known to have been bred in captivity. Jewel beetles are protected fauna in Western Australia. However, one private individual has had permission to collect Buprestids since 1980. Also, since 1986, six persons have been issued with Scientific Licences specifically to collect Buprestidae. A further 21 persons have been issued with Scientific Licences to collect invertebrates generally (Morrison, *in litt.*, 20 July 1990). Only one case of illegal collection of Buprestids has proceeded to prosecution; in 1980, an individual was charged with the unlawful possession of 771 specimens (Morrison, *in litt.*, 20 July 1990).

There seems little doubt that trade in Australian Buprestidae has increased over the past few years despite controls imposed by State and Federal laws.

### Coleoptera, Lucanidae

None of the six Lucanid species identified in this report is known to have been captive bred. However, many specimens are obtained by rearing out field-collected larvae (Monteith, *in litt.*, 2 April 1990). The species subject to the most trade are *Cacostomus squamosus*, the two *Lissotes* species and, particularly, *Phalacrognathus muelleri*. All species seem to command relatively high prices, ranging from A\$20 each for *C. squamosus* to A\$1071 each for *P. muelleri*.

Collection and Export of Australian Insects

Species	Unit of Sale	Price range A\$ (average price)	Years advertised	No. times advertised	Dealers' country
<b>LEPIDOPTERA</b>					
<b>Papilionidae</b>					
<i>Ornithoptera priamus richmondia</i>	pair	(182)	< >	2	DE
<i>O.p. euphorion</i>	pair	(64)	>	1	DE
<i>Papilio (Graphium) macleayanum</i>	each (F)	(64)	>	1	DE
<i>P. ulysses joesa</i>	pair	(50)	>	1	DE
<b>Saturniidae</b>					
<i>Coscinocera hercules</i>	each	(34)	>	1	FR
	pair	(71)	>	1	DE
<i>Antheraea eucalypti</i>	cocoon (each)	(4)	<	1(1)	DE
	cocoon (10)	(39)	<	1(1)	DE
	egg (12)	6-9(7)	<	3(3)	DE
<b>COLEOPTERA</b>					
<b>Buprestidae</b>					
<i>Chalcotaenia quadriimpressa</i>	each	4-17(11)	>	2(1)	DE
<i>Curis yalgoensis</i>	each	(4)	>*	1	FR
<i>Julodimorpha bakewelli</i>	each	7-31(16)	>*	3(1)	DE,FR
<i>Stigmodera acuticeps</i>	each	(4)	>*	1(1)	FR
<i>S. aeraticollis</i>	each	(4)	>*	1(1)	FR
<i>S. atricollis</i>	each	(9)	>	1	DE
<i>S. bonvouloiri</i>	each	(13)	>*	1(1)	FR
<i>S. brucki</i>	each	4-17(8)	>*	4(3)	DE,FR
<i>S. bucolica</i>	each	(3)	>*	1(1)	FR
<i>S. cancellata</i>	each	(32)	>*	1(1)	FR
<i>S. caroli</i>	each	9-21(18)	>*	6(1)	DE,FR
<i>S. chalcodera</i>	each	4-13(9)	>*	3(1)	DE,FR
<i>S. chevrolati</i>	each	14-34(21)	< > *	6(3)	DE,FR
<i>S. cincta</i>	each	(4)	>*	1(1)	FR
<i>S. conspicillata</i>	each	(29)	>*	1(1)	FR
<i>S. crenata</i>	each	(9)	>	1	DE
<i>S. crocicolor</i>	each	(4)	>*	1(1)	FR
<i>S. cruentata</i>	each	(3)	>*	1(1)	FR
<i>S. doponti</i>	each	(36)	>	1	DE
<i>S. filiformis</i>	each	(3)	>*	1(1)	FR
<i>S. flava</i>	each	(3)	>*	1(1)	FR
<i>S. flaviceps</i>	each	(4)	>*	1(1)	FR
<i>S. georgiana</i>	each	(9)	>	1	DE
<i>S. gratiosa</i>	each	9-11(10)	>*	2(2)	FR
<i>S. helenae</i>	each	(13)	>	1	DE
<i>S. heros</i>	each	14-50(29)	< > *	5(3)	DE,FR,IT
<i>S. immaculata</i>	each	3-6(4)	>*	2(1)	DE,FR
<i>S. lessoni</i>	each	(14)	<	1	IT
<i>S. martini</i>	each	(16)	>*	1(1)	FR
<i>S. miranda</i>	each	15-49(34)	< > *	3(1)	DE,FR
<i>S. mniszehi</i>	each	16-57(43)	< > *	3(1)	DE,FR,
<i>S. murrayi</i>	each	6-26(13)	< > *	5(2)	DE,FR,IT
<i>S. mustelamajor</i>	each	(3)	>*	1(1)	FR
<i>S. obscureipennis</i>	each	(13)	>*	1(1)	FR
<i>S. oleata</i>	each	(13)	>*	1(1)	FR
<i>S. pallidipennis</i>	each	(3)	>*	1(1)	FR
<i>S. pallidiventris</i>	each	(4)	>*	1(1)	FR
<i>S. parallela</i>	each	5-9(7)	>*	2(1)	DE,FR
<i>S. picta</i>	each	(3)	>*	1(1)	FR
<i>S. pictipes</i>	each	14-23(17)	>*	2(2)	DE,FR
<i>S. placens</i>	each	3-4(3.5)	>*	2(2)	FR
<i>S. princeps</i>	each	23	>*	1(1)	FR
<i>S. quadrifasciata</i>	each	4	>*	1(1)	FR

Table 2. Australian insect species advertised for sale overseas

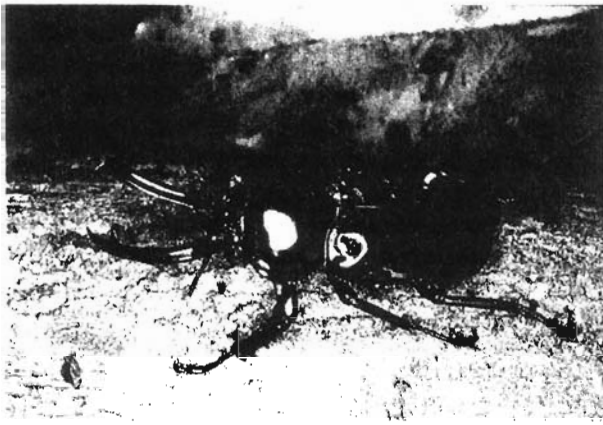
< = advertised before 1984; > = advertised during or after 1984; \* = advertised during 1988. N = number of times the species has been advertised for sale. Bracketed figure indicates number of advertisements stating more than one unit was available. Does not include instances where no indication of availability was given. NPA = no price available. DE-(F.R.) Germany; FR-France; IT-Italy. F = female; M = male.

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Species	Unit of sale	Price range A\$ (average price)	Years advertised	No. times advertised	Dealers' country
<i>Stigmodera rectipennis</i>	each	(32)	>*	1(1)	FR
<i>S. reichei</i>	each	18-21(20)	>*	2(1)	FR
<i>S. richardsi</i>	each	4-16(10)	>*	2(1)	DE,FR
<i>S. roei</i>	each	17-64(30)	< >*	6(1)	DE,FR
<i>S. rufipennis</i>	each	4-9(6)	>*	2(2)	FR
<i>S. rufolimbata</i>	each	(4)	>*	1(1)	FR
<i>S. sanguinolenta</i>	each	(3)	>*	1(1)	FR
<i>S. sanguinosa</i>	each	(36)	>*	1(1)	FR
<i>S. secularis</i>	each	(23)	>*	1(1)	FR
<i>S. simulata</i>	each	(4)	>*	1(1)	FR
<i>S. subinecta</i>	each	(4)	>*	1(1)	FR
<i>S. tibialis</i>	each	18-23(21)	>*	3(2)	DE,FR
<i>S. varicollis</i>	each	(26)	>*	1(1)	FR
<i>S. vegeta</i>	each	(9)	>	1	DE
<i>S. wimmerae</i>	each	18-19(18.5)	>*	2(2)	FR
<i>S. yarelli</i>	each	18-20(19)	>*	2(2)	FR
Australian Buprestidae	pack of 6	(49)	>	1	DE
Lucanidae					
<i>Cacostomus squamosus</i>	pair	7-57(24)	< >	4	DE,FR
	each (M)	(20)	>	1	DE
	pack of 10 (M)	(129)	>	2	DE
<i>Lamprima aurata</i>	each (F)	(36)	>	1	DE
	each (M)	32-36(34)	>	1(1)	DE
	pair	(57)	>	1	DE
	pack of 10 (M)	143-179(161)	>	2	DE
<i>Lissotes obtusatus</i>	each (M)	(29)	>	2	DE
	pair	(57)	>	3	DE
	pack of 10 (M)	(179)	>	2	DE
<i>L. rudis</i>	each (M)	(29)	>	2	DE
	pair	(57)	>	3	DE
	pack of 10 (M)	(179)	>	2	DE
<i>Phalacrognathus muelleri</i>	each (F)	(107)	<	1	FR
	each (M)	(107)	>	1	DE
	each (?)	NPA	>	1(1)	FR
	pair	571-1143(887)	< >	7(3)	DE,FR
	unknown	NPA	< >	3	DE,FR
<i>Rhyssonotus nebulosus</i>	each	(68)	>	1(1)	DE
	15 "pieces"	(536)	>	1	DE
Scarabaeidae					
<i>Anoplognathus aeneus</i>	each	(11)	<	2	DE,IT
<i>A. boisduvali</i>	each	6-16(11)	< >*	8(3)	DE,FR
<i>A. hirsutus</i>	each	(11)	<	1	IT
<i>A. parvulus</i>	each	5-11(8)	<	10	DE,IT
<i>A. porosus</i>	each	4-5(4.5)	< >*	2	DE,FR
<i>A. punctulatus</i>	each	(4)	>	1	FR
<i>A. smaragdinus</i>	each	6-14(10)	< >*	5	DE,FR
<i>A. viridiaeneus</i>	each (M)	NPA	<	1	DE
<i>Calloodes atkinsoni</i>	each	(4)	<	2	DE
<i>C. grayanus</i>	each	6-19(14)	<	6	DE,IT
<i>C. rayneri</i>	each	(4)	<	1	DE
<i>Diaphonia dorsalis</i>	each	(10)	>*	1(1)	FR
<i>D. mniszechi</i>	each	7-10(8)	>*	2(2)	FR
<i>Metallesthes metallescens</i>	each	(3)	>*	1(1)	FR
<i>Repsimus aeneus</i>	each	(3)	>*	2	DE,FR
<i>Trichaulax marginipennis</i>	each	NPA	<	1	DE
<i>Xylotrupes gideon</i>	each	1-6(3.5)	< >	4(1)	DE

Table 2 continued. Australian insect species advertised for sale overseas

Prices converted using the average exchange rate at the time the report was prepared, i.e., DM1.4=A\$1; F4.7=A\$1.

*Phalacrognathus muelleri*

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*Cacostomus squamosus* is probably the most common of the six Lucanid species discussed in this report. *Lamprima aurata* is also not uncommon, whereas the remaining four species are uncommon to rare. The biology of all species appears to be fairly poorly known. The wingless Tasmanian *Lissotes* species are generally considered to be rare and have restricted rainforest distributions. They are collected by rolling the logs in which they breed and thus are quite vulnerable to systematic collection in isolated patches of temperate rainforest (Monteith, *in litt.*, 2 April 1990). Thus, the sale of two *Lissotes* species in Europe for moderate prices during recent years is of much interest.

However, the species of most interest is *Phalacrognathus muelleri*. It is perhaps the most striking and colourful of all Australian beetles and is eagerly sought after by collectors (Hawkeswood, 1987). Restricted to tropical rainforests of northeast Queensland, it is generally considered to be rare (Hancock, 1970), and is certainly infrequently collected (Monteith, *in litt.*, 2 April 1990). However, recent literature suggests that the larvae can be located in rotting logs in virtually any rainforest throughout their distribution (Wood and Hasenpusch, 1990). Rearing out larvae is a particularly common method of obtaining adult specimens of this species (Monteith, *in litt.*, 15 November 1988).

*Phalacrognathus muelleri* continues to sell in Europe for comparatively very high prices, often surpassing prices asked for many of the rare and eagerly sought-after birdwing butterflies. The males, usually with large mandibles, seem to be especially in demand. The continued collection of *P. muelleri* for overseas sale, and the destruction of its rainforest habitat, are of great concern.

#### Coleoptera, Scarabaeidae

Eight species of Christmas beetle of the genus *Anoplognathus* are identified in this report as being in trade. However only one species (*A. punctulatus*) has been offered for sale in the past five years. The species most often advertised are *A. boisduvali*, *A. parvulus* and *A. smaragdinus*, the latter being uncommon to rare. However, trade in the entire genus appears to be at insufficient levels to pose a threat.

*Xylotrupes gideon* is a large (4.5-5.5 cm), glossy black beetle commonly known as the Elephant or Rhinoceros Beetle, presumably because of the large bifurcate horns found on the head of the male (Hawkeswood, 1987). It is found in Australia (where it is often common within its range), Papua New Guinea, some Pacific islands, and parts of Southeast Asia. The Australian population may represent a different race of the species. It is commonly advertised for sale in Europe but most of the material appears to have been collected outside Australia.

The other species of the Scarabaeidae family identified in this report do not seem to be under any threat from trade. They are either relatively common - e.g. *Diaphonia dorsalis*, *Metallesthes metallescens*; rarely offered in trade - e.g. *Repsimus aeneus*, *Trichaulax marginipennis*; not recently offered for sale - e.g. *Calloodes* spp.; or a combination of these. None of the Scarabaeids identified in trade is known to have been captive bred.

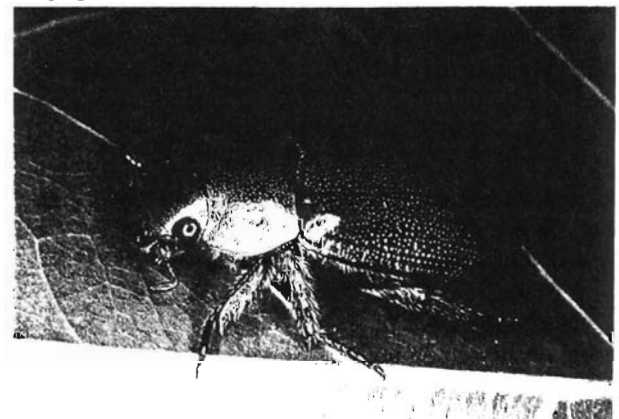
#### CONCLUSIONS AND RECOMMENDATIONS

Of the species identified in this report, the one which most obviously seems to require greater protection, particularly from illegal trade, is *Phalacrognathus muelleri*. Regulation of trade could occur within its native State of Queensland, if the species was declared to be fauna under the *Queensland Fauna Conservation Act*. At an international level, consideration should be given to listing the species on Appendix II or III of CITES. (Appendix III listing is unrealistic at the present time as Australia's wildlife import/export laws contain no provisions for the recognition of Appendix III species.)

All commercial exports of *Phalacrognathus muelleri* to date have been illegal (see Postscript). The *modus operandi* of export - packages mailed through the post - makes enforcement from Australia virtually impossible. It could be argued that this problem will remain after CITES listing. However CITES Appendix II listing would at least provide some measure of control and monitoring by importing countries.

*Anoplognathus aeneus*

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Members of the Buprestidae family seem to be the only other species of Australian insects subject to significant illegal trade. Controls on this trade already exist at the State level in Western Australia and at the Federal level. The level of trade, and threat imposed by it, are currently insufficient to warrant CITES listing. However, trade controls of any sort will have little real impact on the conservation of the Buprestids unless their habitat is protected. The Western Australian government should be encouraged to address this problem. Given the recent increases in the level of trade in this family, any relaxation of legal protection would be ill-advised.

The remaining species identified in trade do not appear to present any immediate cause for concern. However, some may require further conservation measures, either because of their general rarity, or because they are threatened by habitat destruction. The protection conferred by the recent listing of the north Queensland rainforests on the World Heritage List may benefit species found there, such as *Anoplognathus aeneus*, *Phalacrognathus muelleri* and *Trichaulax marginipennis*.

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#### POSTSCRIPT

Since this report was written, an entomologist/dealer in north Queensland has apparently succeeded in breeding *Phalacrognathus muelleri* in captivity. A total of 16 permits, covering 182 specimens, have been issued by the Australian National Parks & Wildlife Service for export of captive bred specimens. The specimens have been exported to France, Germany, Japan, Spain and Switzerland (ANPWS, *in litt.*, 8 January 1991).

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