

Review of the biology and host plants
of the Australian longicorn beetle
Agrianome spinicollis (Macleay)
(Coleoptera: Cerambycidae)

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Abstract

The biology and host plants of the Australian longicorn beetle *Agrianome spinicollis* (MACLEAY) (Cerambycidae: Prioninae) are reviewed from the available literature and previously unpublished data. A total of 20 larval host plants from 12 families are known: *Schinus* (Anacardiaceae), *Howea* (Arecaceae), *Bauhinia*, *Delonix* (Caesalpinaceae), *Casuarina* (Casuarinaceae), *Acacia* (Mimosaceae), *Ficus* (Moraceae), *Angophora*, *Eucalyptus* (Myrtaceae), *Grevillea* (Proteaceae), *Malus* (Rosaceae), *Citrus* (Rutaceae), *Salix* (Salicaceae), *Solanum* (Solanaceae) and *Brachychiton* (Sterculiaceae). Although some of the host plant records need further verification, the list indicates that *A. spinicollis* is polyphagous in the larval stage. The species is widely distributed in eastern Australia and on Lord Howe Island and occurs in a wide range of habitats ranging from sclerophyll forests to rainforests.

Introduction

Agrianome spinicollis (MACLEAY) (Cerambycidae: Prioninae) (Fig. 2) is one of the largest longicorn beetles from Australia. The adults of this species have a dark reddish-brown head, thorax and legs, while the elytra are dark buff-brown in colour; the total body length of adults varies from 35-55 mm (HAWKESWOOD, 1987). The species occurs mostly in eastern Queensland and New South Wales and has been recorded from Lord Howe Island (LEA, 1916). Opportunity is taken here to review the information on the biology and host plants of this species.

Larval host plants

In the list below, non-native, introduced plants are marked with an asterisk.

Howea forsteriana (C. MOORE & F. MUELL.) H. WENDL. & DRUDE (Arecaceae). **Citrus sinensis* (L.) OSBECK (Rutaceae) (LEA, 1916); **Schinus areira* L.

(= *S. molle* L.) (Anacardiaceae) (DUFFY, 1963; WEBB, 1987); **Delonix regia* (BOJ. ex HOOK.) RAF. (Caesalpiniaceae) (DUFFY, 1963); **Bauhinia forficata* LINK (Caesalpiniaceae) (HOCKEY & DE BAAR, 1988); *Grevillea robusta* A. CUNN. ex R. Br. (Proteaceae) (DUFFY, 1963; WEBB, 1987); *Angophora floribunda* (SM.) SWEET, *Eucalyptus acmenioides* SCHAU. and *E. saligna* SM. (Myrtaceae) (DUFFY, 1963); *Casuarina* sp. (Casuarinaceae) (WEBB, 1987); **Salix* sp. (Salicaceae) (WEBB, 1987); *Acacia* sp. (Mimosaceae) (WEBB, 1987); *Brachychiton populneus* (SCHOTT & ENDL.) R. Br. (Sterculiaceae) (WEBB, 1987); **Malus pumila* MILL. (Rosaceae) (WEBB, 1987); *Ficus macrophylla* DESF. ex PERS. (Moraceae) (WEBB, 1987); *Ficus watkinsiana* F. M. BAIL. (Moraceae) (HOCKEY & DE BAAR, 1988); **Populus deltoides* MARSH (Salicaceae) (WEBB, 1987; WEBB, WILLIAMS & DEKEYSER, 1988); **Populus nigra* MILL. and **Populus* sp. (WEBB, 1987); **Solanum mauritianum* SCOP. (Solanaceae) (HOCKEY & DE BAAR, 1988).

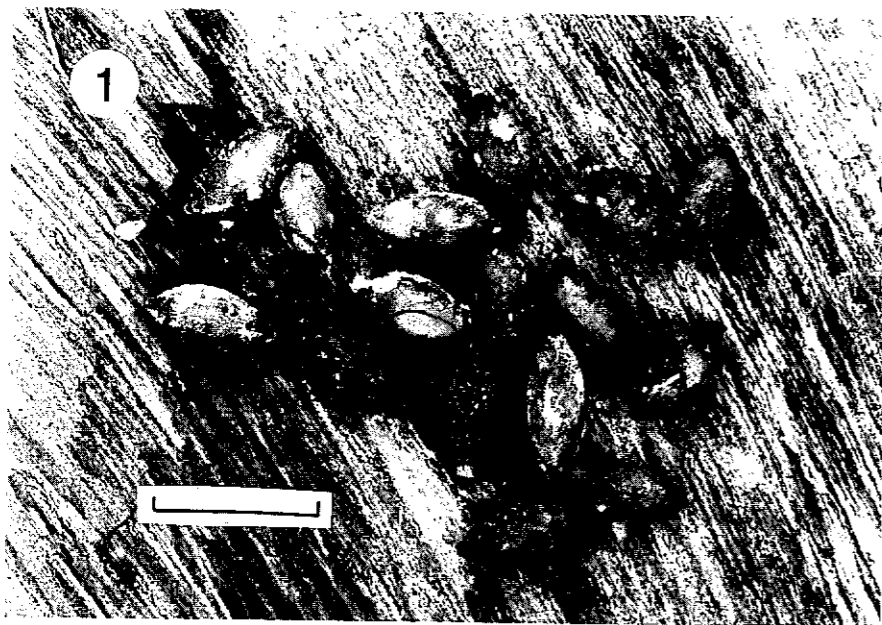


Fig. 1. Eggs of *Agrianome spinicollis* (MACLEAY) from a female collected at Mt. Glorious, Queensland. Scale line = 5 mm. (Photo T.J. HAWKESWOOD).

Life-stages

The egg has been described and illustrated by DUFFY (1963). The egg is fusiform, with one end more bluntly tapering than the other, both ends subtruncate and carinate apically. The chorion is dark brown and somewhat densely covered with large, round, deep, regularly-spaced punctures. Length 4.0-4.2 mm, width 1.6-1.7 mm (DUFFY, 1963; this paper, Fig. 1).

The larva is figured by LEA (1916), AURIVILLIUS (1917), BRIMBLECOMBE

(1956) and HAWKESWOOD (1987) and is described in some detail by DUFFY (1963).

The pupa is figured by BRIMBLECOMBE (1956) and is described in some detail by DUFFY (1963).

A colour photograph of the adult is provided by HAWKESWOOD (1987), while LEA (1916) illustrates the male and female beetle.

Biology

LEA (1916) provided the first published observations on the species. According to LEA (1916), the species was relatively common on Lord Howe Island, east of New South Wales, and numerous adults were collected at night on the trunks of various trees. The larvae were reported to construct large galleries and to eject large quantities of frass. LEA (1916) also reported that the galleries eventually became exposed through the action of other insects and fungi, and that the large hollows so formed were often found to be occupied by a large phasmid, *Karabidion australe* MONTR. A large orange tree (*Citrus sinensis* (L.) OSBECK, Rutaceae) was almost destroyed by the larvae (LEA, 1916). LEA (1916, plate XV) illustrates the damage done by the beetle and finally noted that very old and rotten logs of many kinds of trees appeared to have been attacked as well as the living trees. The larvae of *A. spinicollis* are known as "witchetty grubs" since they were often extracted from rotten logs by the islander aborigines to be eaten or used as fish bait (LEA, 1916; DUFFY, 1963).

K.M. MOORE in DUFFY (1963) provided the following data on the biology of *A. spinicollis* - Apparently growing trees only are attacked by this species, though larvae may continue to develop in logs. The life-cycle occupies at least two years, possibly three or four years. The vertical larval galleries occur close together, deep in the timber in the centre of the tree. Injured areas on bases of trunks are susceptible to attack. A cross-section of a tree trunk may show various holes varying in size, filled with either loose or firmly packed excreta. Larvae of various instars may be found together in the same area of a tree. Larvae work in subcontiguous galleries, usually along the grain of the wood, but occasionally across the grain for short distances. Owing to their habit of tunnelling deep into a tree, larvae can survive intense bush-fires, even though the log or tree has been considerably affected by the fire. Larvae taken by MOORE from *Eucalyptus saligna* SM. (Myrtaceae) were found to be predominantly pink in colour, while those from *Eucalyptus acmenioides* SCHAU. were pale brown, while from *Angophora floribunda* (SM.) SWEET (listed as *A. intermedia*) the larvae were cream in colour, apparently as a response to the colour and chemical composition of the various timbers (MOORE in DUFFY, 1963). Pupation occurs in cells surrounded by coarse strips of wood which are finer than those in the cells of *Eurynassa australis* (BOISDUVAL) (DUFFY, 1963). Adults emerged from reared specimens during summer (December) but others have been collected during mid- to later summer (January to February) (DUFFY, 1963).

The following notes are from field observations of the senior author- On 16 December 1983, one female (Fig. 2) of *A. spinicollis* was collected at lights at night at Mt. Glorious, about 20 km west of Brisbane, Queensland, at the inter-

face of wet sclerophyll forest and sub-tropical rainforest. The beetle stridulated loudly and attempted to bite fiercely when handled. Later, in the laboratory, the female laid a total of 18 eggs over a three-day period and managed to live for 2 weeks.



Fig. 2. Adult female of *Agrianome spinicollis* (MACLEAY) from Mt. Glorious, Queensland. Scale line = 25 mm. (Photo: from HAWKESWOOD, 1987).

Published collection records with biological data

Lisarow, New South Wales, 1911, collector unknown, from apple tree, *Malus pumila* MILL. (WEBB, 1987); Brisbane, Queensland, 11 Nov. 1940, A. R. BRIMBLECOMBE, from *Grevillea robusta* A. Cunn. ex R. Br. (DUFFY, 1963); Warwick, Queensland, 1946, P. MILLER, from *Acacia* sp. (WEBB, 1987); Boggabri, New South Wales, 1953, L. Penrose, from pepper tree, *Schinus areira* L. (WEBB, 1987); Dorrigo National Park, New South Wales, 1955, collector unknown, from Moreton Bay fig, *Ficus macrophylla* DESF. ex PERS. (WEBB, 1987); Lisarow, New South Wales (?), 16 June 1956, K.M. MOORE, from *Angophora floribunda* (SM.) SWEET (DUFFY, 1963); Ourimbah, New South Wales, 19 Nov. 1959, K. M. MOORE, from *Eucalyptus acmenioides* SCHAU. (DUFFY, 1963); Lisarow, New South Wales, 30 March 1957; K. M. MOORE, from *E. acmenioides* (DUFFY, 1963); Sydney, New South Wales, 1957, A. D. L. MERCER, from peppercorn tree, *Schinus areira* L. (WEBB, 1987); Dungog, New South Wales, 1965, P. J. HENRY, from *Populus nigra* MILL. (WEBB, 1987); Dubbo, New South Wales, 1970, J. BRENNAN, from *Grevillea robusta* (WEBB, 1987); Brisbane, Queensland,

13 Nov. 1979, M. J. HOCKEY, from the trunk of a dying *Bauhinia forficata* LINK (?) (HOCKEY & DE BAAR, 1988); Mt. Glorious, Queensland, 29 Dec. 1979, M. J. HOCKEY, from log of *Ficus watkinsiana* F. M. BAIL. (HOCKEY & DE BAAR, 1988); St. Georges Basin, New South Wales, 1981, E. JOHNS, from *Casuarina* sp. (WEBB, 1987); Long Pocket, Brisbane, Queensland, 7 Jan. 1981, M. J. HOCKEY, from decayed wood of *Solanum mauritianum* SCOP. (HOCKEY & DE BAAR, 1988); Cobar, New South Wales, 1982, R. M. MCQUEEN, from kurrajong, *Brachychiton populneus* (SCHOTT & ENDL.) R. Br. (WEBB, 1987); Upper Colo, New South Wales, 1983, E. E. TAYLOR, from *Populus deltoides* MARSH (WEBB, 1987); New port, Sydney, New South Wales, 1984, E. E. TAYLOR, from *Salix* sp. (WEBB, 1987); Upper Colo, New South Wales, 11 Jan. 1984, E. E. TAYLOR, from *Populus deltoides* (WEBB, WILLIAMS & DEKEYSER, 1988); Kempsey, New South Wales, 14 Jan. 1985, E. E. TAYLOR, from *P. deltoides* (WEBB, WILLIAMS & DEKEYSER, 1988).

Discussion

Agrianome spinicollis is an active, nocturnal cerambycid beetle which is polyphagous in the larval stages for a wide variety of hardwood trees. Throughout its range in New South Wales, Queensland and Lord Howe Island, it appears to be uncommon and sporadic, possibly as a consequence of its 2-4 year life-cycle, i.e. in some seasons, few or no adults may be present. Most adult specimens lodged in Australian museums have been collected at night, being attracted to lamps or lights in houses, sheds, etc., during the summer months of December to February. *Agrianome spinicollis* has a coastal and inland distribution in mainland Australia and is well-adapted for breeding in the living timber of such introduced trees as *Schinus* (Anacardiaceae), *Bauhinia* (Caesalpinaceae), *Malus* (Rosaceae) and *Populus* (Salicaceae). In many areas where the beetle frequents, e.g. Lisarow and Sydney (New South Wales) and Warwick (Queensland), there have been marked changes to the natural vegetation which have been brought about by farming, housing developments and/or industry. The survival of *A. spinicollis* in these areas appears to be maintained by the beetles shifting their feeding preferences to these introduced plants. While some of the host records reviewed in this paper require further verification, e.g. *Acacia* (Mimosaceae) (WEBB, 1987), *Bauhinia* (Caesalpinaceae) (HOCKEY & DE BAAR, 1988), *Casuarina* (Casuarinaceae) (WEBB, 1987), *Citrus* (Rutaceae) (LEA, 1916), *Delonix* (Caesalpinaceae) (DUFFY, 1963) and *Howea* (Arecaceae) (LEA, 1916), the host data shows clearly that *A. spinicollis* is one of the most polyphagous species of Australian Cerambycidae (HAWKESWOOD, unpub. data). It occurs in coastal and inland eastern Australia in wet and dry sclerophyll forests, rainforests and woodlands. No doubt further collections of this beetle, especially from the more inland regions of its range, will produce further host records and other biological data. Of particular interest would be observations on its survival in coastal areas undergoing rapid environmental change through habitat destruction.

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Liste rouge des Lépidoptères Rhopalocères de Belgique

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Résumé

L'examen de la vulnérabilité des 120 espèces de Rhopalocères appartenant à la faune belge est réalisé en utilisant les critères de l'UICN. Cette évaluation a permis de considérer 8 espèces comme éteintes depuis 1970 et 64 comme menacées car reprises dans les catégories "En danger", "Vulnérable", "Rare" ou "Indéterminé". Pour ces dernières, seules la conservation et la gestion d'habitats semi-naturels permettront le maintien de populations viables en Belgique.

Introduction

La faune des Lépidoptères Rhopalocères subit actuellement une transformation importante en Europe occidentale: beaucoup d'espèces liées aux milieux semi-naturels régressent ou disparaissent alors qu'un petit nombre d'espèces ubiquistes sont en augmentation. En Belgique, près de 70 % des espèces de la faune belge présentent une contraction significative de leur aire de répartition, ainsi qu'une raréfaction de leurs effectifs (BAGUETTE *et al.*, sous presse). Il s'agit d'espèces ayant des aires de distribution géographique et des caractéristiques écologiques très différentes: des espèces à distribution boréo-alpine, comme *Boloria aquilonaris* par exemple sont concernées au même titre que des espèces thermophiles comme *Iphiclides podalirius*, pour lesquelles les versants calcaires de la vallée de la Meuse et de ses affluents constituent la limite septentrionale de l'aire de répartition en Europe occidentale. Les changements climatiques ne peuvent donc pas être considérés comme étant la cause de la raréfaction des papillons de jour en Belgique au cours de ce siècle, même si ce facteur peut jouer un rôle déterminant dans l'évolution des aires de distribution chez ces insectes (DENNIS & SHREEVE, 1991).

Cette régression est imputable aux activités humaines, qui ont profondément modifié l'environnement naturel et semi-naturel durant la seconde moitié du vingtième siècle. Suivant leurs caractéristiques écologiques et biogéographiques, les espèces de Rhopalocères réagissent différemment à cette modification, et sont plus ou moins vulnérables. Le but de cet article est de faire le point sur le degré de vulnérabilité de chaque espèce de papillon de jour en Belgique, en utilisant les critères proposés par l'Union Internationale de la Conservation de la Nature (UICN).