

Allen, S. and Huvenciers, C. (2005). First record of an Australian fur seal (*Arctocephalus pusillus doriferus*) feeding on a wobbegong shark (*Orectolobus ornatus*). *Proceedings of the Linnean Society of New South Wales* **126**, 95-97.

The Australian fur seal (*Arctocephalus pusillus doriferus*) is listed as a 'vulnerable' species in New South Wales (NSW) under the Threatened Species Conservation Act, recovering from exploitation by commercial sealing activities around southeastern Australia. Recent dietary studies indicate they are generalist predators that feed on a wide variety of both vertebrates (fish and, occasionally, birds) and invertebrates (cephalopods and, occasionally, crustaceans). While a small number of elasmobranchs have been reported from the diets of a variety of fur seal species, no published evidence exists of either fur seals preying on wobbegongs (*Orectolobus* spp.), or of large wobbegongs as prey items in the diet of any predator. Here we describe an account of an Australian fur seal feeding on a large ornate wobbegong (*Orectolobus ornatus*). Wobbegongs are also listed as 'vulnerable' in NSW by the IUCN, with commercial fishing catch having dropped over 50% from 1990-2000. Knowledge of relationships between high trophic level species is important for assessing interactions between marine mammals and fisheries and also presents interesting challenges for the conservation of commercially targeted species.

Barton, P.S. and Aberton, J.G. (2005). Larval development and autogeny in *Ochlerotatus camptorhynchus* (Thomson) (Diptera: Culicidae) from southern Victoria. *Proceedings of the Linnean Society of New South Wales* **126**, 261-267.

Larval development and autogeny was examined in the mosquito *Ochlerotatus camptorhynchus* (Thomson) from southern Victoria. Larvae of *Oc. camptorhynchus* were reared in the laboratory at 5 constant temperatures (15, 20, 25, 30 and 35°C) and three constant salinities (0, 18 and 36 ppK). Of the five temperatures, survival ranged from 35.6% at 35°C to 84.4% at 20°C, and development times ranged from 12.1 to 37.1 days at 35°C and 15°C respectively. The minimum threshold temperature for development was 7.3°C, and the thermal constant was 324.0 ± 12.8 SE degree-days. No differences in development times or survival were detected for the three salinities. Adult mosquitoes reared from field-collected pupae and larvae reared on a high-nutrition diet displayed no autogenous egg development. A positive relationship was found between adult body size (wing length) and fecundity in blood-fed adults, with fecundity ranging from 40 to 112 eggs per female.

Holmes, W.B.K. and Anderson, H.M. (2005). The Middle Triassic megafossil flora of the Basin Creek Formation, Nymboida Coal Measures, New South Wales, Australia. Part 4. Umkomasiaceae. *Dicroidium* and affiliated fructifications. *Proceedings of the Linnean Society of New South Wales* **126**, 1-37.

The forked leaves of the morpho-genus *Dicroidium* are the most commonly occurring foliage in the collections from two quarries in the Middle Triassic Basin Creek Formation at Nymboida, N.S.W. The extensive Nymboida collections include leaves which, in gross morphology, range from simple with entire margins to pinnatifid, pinnate, bipinnatifid and bipinnate forms. The wide range of variation, which includes intergrading forms, creates problems in establishing species boundaries. For comparison with other Gondwanan material, the Nymboida leaves have been placed in five 'species complexes' distinguished as '*Dicroidium coriaceum*', '*D. odontopteroides*', '*D. lineatum*', '*D. dubium*' and '*D. zuberi*'. In each complex there is a continuum of variation of form and there are intergrading forms that link each complex. Illustrations of over eighty leaves demonstrate the range of variation present. A single leaf only of *D. elongatum* has been collected. An unusual leaf is described as *?D. nymboidense* sp. nov. Fertile material affiliated with *Dicroidium* includes three species of female strobilus, *Umkomasia distans*, *U. sessilis* and *U. sp. A.* together with dispersed cupules and ovules. Microsporophylls are placed in *Pteruchus* sp. cf. *P. matatamajor* and a single specimen in *P. sp. A.*

Holmes, W.B.K. and Anderson, H.M. (2005). The Middle Triassic megafossil flora of the Basin Creek Formation, Nymboida Coal Measures, New South Wales, Australia. Part 5. The genera *Lepidopteris*, *Kurtziana*, *Rochipteris* and *Walkomiopteris*. *Proceedings of the Linnean Society of New South Wales* **126**, 39-79.

Leaves attributed to the gymnosperm genera *Lepidopteris*, *Kurtziana* and *Rochipteris* and the leaf sedis incertae *Walkomiopteris eskensis* (Walkom) Holmes and Anderson gen. et comb. nov. are described from two quarries in the Basin Creek Formation of the Middle Triassic Nymboida Coal Measures. Based on extensive collections of leaves, the morpho-genera *Lepidopteris* and *Kurtziana* each reveal a wide range of variation. *Lepidopteris* is divided into three 'morpho-species complexes' with intergrading forms based on *L. madagascariensis*, *L. africana* and *L. stormbergensis* and a new species *L. dissitipinnula* apparently without links to the three complexes. The *Lepidopteris* fertile organs, *Peltaspermum* and *Antevsia* are present. *Kurtziana* is separated

into two 'morpho-species complexes' based on *K. brandmayri* and *K. cacheutensis*. *Rochipteris* is a diverse genus but of very rare occurrence. Six new species are described; *R. obtriangulata* and *R. tubata* display a close-spaced spiral or whorled arrangement. Seven leaves of *R. incisa* have been examined. *R. sinuosa*, *R. pusilla* and *R. nymboïdensis* are represented by single dispersed leaves. *Walkomiopteris eskensis* (Walkom) gen. et comb. nov. is redescribed from additional Nymboïda material.

Jerry, D.R. (2005). Electrophoretic evidence for the presence of *Tandanus tandanus* in New South Wales rivers north and south of the Hunter River. *Proceedings of the Linnean Society of New South Wales* **126**, 121-124.

Eel-tailed catfish from the genus *Tandanus* are morphologically conservative. Previous allozyme electrophoretic surveys have demonstrated that up to three species of *Tandanus* catfish occur in south-eastern Australian freshwater streams. Two of these species are previously undescribed cryptic species. However, the taxonomic status of catfish in many coastal river systems is yet to be examined using allozyme electrophoresis. In this study four diagnostic allozyme markers were used to determine the taxonomic status of eel-tailed catfish in four NSW coastal populations from the Wallamba, Coolongolook, Hawkesbury and Georges River systems. Electrophoretic analyses demonstrated that the species of catfish in these four populations is *T. tandanus*. These results extend the distribution of *T. tandanus* to the coastal rivers immediately north and south of the Hunter River, NSW.

Keith, D. and Pellow, B. (2005). Effects of Javan Rusa deer (*Cervus timorensis*) on Native Plant Species in the Jibbon-Bundeena Area, Royal National Park, New South Wales. *Proceedings of the Linnean Society of New South Wales* **126**, 99-110.

A reconnaissance survey and enclosure experiment were carried out to examine the effects of Javan rusa deer on native flora and vegetation in Royal National Park on the southern outskirts of Sydney, Australia. Of 78 native plant species examined during the survey, only nine showed no evidence of vertebrate herbivory or physical damage and the majority of these plants were ferns and sedges. The other 69 species showed effects that included defoliation (young and/or old leaves), removal of shoots, bark-stripping, stem breakages and destruction or consumption of reproductive material. These effects varied in severity between species and from place to place, and were inferred to have been caused by deer based on the local abundance of deer droppings, footprints and the scarcity of other vertebrate herbivores in the area. The survey also revealed localised soil erosion associated with high densities of deer footprints and droppings. An unreplicated enclosure experiment showed that planted saplings of *Syzygium paniculatum*, a threatened rainforest tree, suffered major defoliation, bark stripping, stem breakages and some mortality when exposed to deer for several months. Many of the surviving plants showed signs of recovery when deer were subsequently excluded, although full recovery of their leaf canopies could take several seasons. The observed effects on vegetation and individual plant species are consistent with studies on several other deer species in a range of ecosystems overseas. A model of the effects of deer herbivory based on plant life-history suggests that curtailment of seed production and seedling recruitment are likely to be the major impacts of deer on plant population viability. Reductions in net growth and survival of established plants and possibly post-dispersal predation of seeds are less likely to be significant influences.

Moulds, M.S. (2005). Song analyses of cicadas of the genera *Aleeta* Moulds and *Tryella* Moulds (Hemiptera: Cicadidae). *Proceedings of the Linnean Society of New South Wales* **126**, 133-142.

The songs of *Aleeta curvicosta*, *Tryella castanea*, *T. crassa*, *T. kauma* and *T. rubra* are analysed. Differences between the songs of the five species are discussed in addition to differences across the distribution of species and within populations. Timbal action of all four *Tryella* species was found to be similar to that of *Aleeta curvicosta*, that is a single muscle contraction produces multiple sound pulses as each rib of the timbal buckles.

A corrigenda to a recent review of the systematics of these genera (Moulds 2003) is provided.

McPherson, J.R. (2005). A recent expansion of its Queensland range by *Eupristina verticillata*, Waterston, (Hymenoptera, Agaonidae, Agaoninae), the pollinator of *ficus microcarpa* l.f. (Moraceae). *Proceedings of the Linnean Society of New South Wales* **126**, 197-202.

In 2004, the first *Ficus microcarpa* seedlings were observed self-establishing in Brisbane, Queensland. Prior to this the only *F. microcarpa* in the city were cultivated specimens. This self-establishment is a certain indicator of the presence of *Eupristina verticillata*, the obligate pollinator wasp of *F. microcarpa*. A *Ficus* species must exceed a critical population size (CPS) for its pollinator, a species of agaonid wasp, and other non-pollinator symbionts to colonize a new area and then maintain their new population. This CPS has often been estimated to be approximately

300 mature trees. The CPS for *F. microcarpa* has been exceeded in Brisbane for some time. Brisbane has been colonized by the wasps *Odontofroggata galili* (a gall species), since at least 1975, and *E. verticillata*, since at least 2004. Previously, the southern extreme of the range of *E. verticillata* was central Queensland, approximately 600 km north of Brisbane. This was probably achieved through a stationary, inland, trough system drawing tropical air to the southeast over a few days. Brisbane's new *E. verticillata* population may not persist, as it must compete for short-styled *F. microcarpa* flowers with a long established *O. galili* population. Further, it must contend with a winter of greater duration and lower mean temperature than its tropical origins may allow.

Paterson, J.R. (2005). Revision of *Discomesites* and *Estaingia* (Trilobita) from the Lower Cambrian Cymbric Vale Formation, western New South Wales: taxonomic, biostratigraphic and biogeographic implications. *Proceedings of the Linnean Society of New South Wales* **126**, 81-93.

The taxonomy of *Discomesites* and *Estaingia* from the Lower Cambrian Cymbric Vale Formation of western New South Wales is revised. *Discomesites* is regarded as a valid subgenus of *Pagetides*. *Pagetides* (*Discomesites*) *fragum* is considered a senior subjective synonym of *P. (D.) lunatulus*. *Pagetides* (*Discomesites*) *spinosus* from the Shackleton Limestone in the Holyoake Range, Transantarctic Mountains, is considered to be a junior subjective synonym of *P. (D.) fragum*. *Estaingia cerastes* from the Cymbric Vale Formation is considered to be synonymous with *Hsuaspis* cf. *H. bilobata* from the Shackleton Limestone. The Cymbric Vale Formation trilobite fauna is of late Early Cambrian (late Botoman) age, equivalent to the *Pararaia janeae* Zone of South Australia, based on correlation of the *Syringocnema favus* archaeocyathan fauna. Absolute ages of recently dated tuffs from the Cymbric Vale and Billy Creek Formations are questioned, based on new information regarding the stratigraphic position of the Cymbric Vale Formation tuff in relation to archaeocyathan and trilobite biostratigraphy. The co-occurrence of *Pagetides* (*Discomesites*) *fragum* and *Estaingia cerastes* in the upper part of the Cymbric Vale Formation and in the Shackleton Limestone represents the first species-level correlation between the Lower Cambrian of Australia and Antarctica using trilobites. The distribution of these trilobite species, in association with the *Syringocnema favus* archaeocyathan fauna, provides supporting evidence that Australia and Antarctica were connected by a continuous carbonate-detrital shelf during the late Early Cambrian (mid-late Botoman), allowing faunal exchange between these regions.

Percival, I.G. and Wright, A.J. (2005). A new early Silurian species of *Trimerella* (Brachiopoda: Craniata) from the Orange district, New South Wales. *Proceedings of the Linnean Society of New South Wales* **126**, 111-120.

*Trimerella australis*, a new species of craniate brachiopod, is described from silicified material extracted from Early Silurian limestone in the Bowan Park district, 22 km west of Orange in central New South Wales. Accompanying conodonts of the *Distomodus staurogathoides* Zone indicate this unnamed unit is mid Llandovery (latest Aeronian to earliest Telychian) in age, and support correlation with the Cobblers Creek Limestone at the base of the Waugoola Group. As with most other occurrences of trimerellide brachiopods in the Late Ordovician and Early Silurian of the Lachlan Orogen, *T. australis* completely dominates its depauperate faunal associates of corals including *Aphyllum?* sp., cf. *Axolasma* sp. and cf. *Halysites cratus* Etheridge, 1904, and very rare atrypide brachiopods. Although all specimens of *T. australis* are disarticulated, the community is interpreted as preserved essentially in situ, representing a very shallow water Benthic Assemblage 2 environment.

Rickards, R.B., Farrell, J.R., Wright, A.J. and Arundell, E.J. (2005). Silurian graptolites from the Barnby Hills Shale and Hanover Formation, New South Wales. *Proceedings of the Linnean Society of New South Wales* **126**, 153-169.

Additional collections of graptolites from the Barnby Hills Shale and new collections of graptolites from the Hanover Formation in the Lachlan Fold Belt of central western N.S.W. are documented. The Late Silurian Hanover Formation is shown to range from the *spineus* Biozone (late Ludlow) to the *parultimus* Biozone (Přidolí). A fauna containing *Monograptus ludensis* is recorded from the Barnby Hills Shale, which is now known to range from the *ludensis* Biozone (late Wenlock) to the *inexpectatus* or *kozłowskii* Biozone (late Ludlow). New dendroid graptolite taxa described here include *Dendrograptus typhlops* sp. nov. from the Barnby Hills Shale and *Dictyonema paululum hanoverense* subsp. nov. from the Hanover Formation. *Monograptus spineus*, from the Hanover Formation, is reported for the first time outside Europe. The new data confirm that strata assigned to the *cornutus* and *praecornutus* biozones (late Ludlow) are widely distributed in central N.S.W., and confirm previous suggestions for a latest Ludlow sea level highstand followed by a shallowing.

Rickards, R.B., Parkes, R.A. and Wright, A.J. (2004). Llandovery (Early Silurian) graptolites from the Quidong Basin, N.S.W. *Proceedings of the Linnean Society of New South Wales* **126**, 143-152.

Late Llandovery (Early Silurian) graptolites from several localities in the Merriangaah Siltstone, Quidong Basin, southern NSW, are described as *Monograptus priodon* (Bronn, 1835), *Oktavites falx* (Suess, 1851) and *Oktavites bodentoeriensis* Loydell, 2003. This is the first use of the generic name *Oktavites* in Australia. The firm age for this fauna to the *spiralis* graptolite Biozone and new age data from the Quidong Limestone place a maximum age for the unconformity between the Siltstone and the overlying Quidong Limestone, constraining the Quidongan Orogeny between the latest part of the Llandovery and the late or latest Wenlock.

Ritchie, A. (2005). *Cowralepis*, a new genus of phyllolepid fish (Pisces, Placodermi) from the Late Middle Devonian of New South Wales, Australia. *Proceedings of the Linnean Society of New South Wales* **126**, 215-259.

*Cowralepis mclachlani*, a new genus and species of phyllolepid placoderm (Pisces, Placodermi), is described from numerous articulated specimens discovered near Cowra, New South Wales, Australia. *Cowralepis*, represented by a growth series, illustrates ontogenetic changes from juvenile to adult and throws new light on the dermal, endocranial, visceral and axial skeleton of phyllolepid and on placoderm interrelationships. The head shield is longer than the trunk shield, the reverse of the situation in other phyllolepid genera. The presence of two pairs of upper tooth plates, plus a posterior dorsolateral plate, an anterior median ventral plate and one or more posterior median ventral plates in the trunk shield is confirmed. The phyllolepid jaw apparatus and associated structures, first reported in *Austrophyllolepis*, are reinterpreted. The branchial skeleton, an occipital ossification and a fused synarcual, previously unknown in phyllolepid, are described. *Cowralepis* had an ossified vertebral column, a large epicercal caudal fin and small pelvic fins but lacked a dorsal fin. The *Cowralepis* material has suffered regional tectonism and illustrates why tectonic deformation must be taken into account in the interpretation of fossils from ancient fold belts.

Semple, W.S. and Koen, T.B. (2005). Altitude, frost and the distribution of white box (*Eucalyptus albens*) on the Central Tablelands and adjacent slopes of NSW. *Proceedings of the Linnean Society of New South Wales* **126**, 171-180.

The apparent rarity of white box (*Eucalyptus albens*) at high altitude has been explained by assuming an intolerance to low temperatures. These propositions were assessed by (a) a field survey of the occurrence of white box at high altitude on part of the NSW Central Tablelands and adjacent slopes and (b) a pot trial study of the response of seedlings of white box and yellow box (*E. melliodora*) to low temperatures during winter 1997. The field survey confirmed that, unlike yellow box, white box was absent from a large part of the Central Tablelands. However, it was recorded at altitudes up to 925 m a.s.l. near Orange but at lower altitudes further south. Aspect was not limiting at high altitude though low slopes appeared to be. Survival and growth of white and yellow box seedlings were low at the high altitude site but there was little difference between species regardless of whether frosted seedlings were subjected to early or delayed exposure to direct morning sunlight. Hence, alternative explanations for the local distribution pattern of white box on the Central Tablelands and adjacent slopes need to be examined.

Moulds, T. (2005). Diversity and biogeography of subterranean guano Arthropod communities of the Flinders Ranges, South Australia. *Proceedings of the Linnean Society of New South Wales* **126**, 125-132.

This study documents the arthropod diversity and ecology of guano-associated species in 12 caves and mines of the Flinders Ranges, South Australia. Twenty two species from 12 orders and two classes are recorded. This represents a five-fold increase in species richness across the region from previously published and unpublished records. Eregunda Mine and Weetootla Gorge Mine 2 were the most diverse with five and six species recorded respectively. Specious groups included the tenebrionid beetle genus *Brises* and the emesine reduviid bug genus *Armstrongula*. Guano communities in the Flinders Ranges contain species in common with the Nullarbor Plain to the west and isolated arid karst areas to the north. There are few affinities with species found in the moist coastal regions of south-eastern Australia.

Wood, A. (2005). Collections of *Galerina* (Agaricales, Fungi) made by J.B. Cleland and housed in the State Herbarium of South Australia. *Proceedings of the Linnean Society of New South Wales* **126**, 181-196.

Twenty-five collections by J.B. Cleland of *Galerina* (or which have been regarded as possibly belonging to *Galerina*) have been studied and their true status has been determined. Details are provided of the size and state of the collections and results are given of microscopic analysis of the material. The results have been evaluated in the light of recent taxonomic studies and suggestions are provided about the taxonomic position of each of the collections, together with discussions of the reasons for the conclusions. Ten of the collections have been shown to belong to genera other than *Galerina*. All the remaining collections have been assigned to previously described species of *Galerina* - *G. lurida*, *G. marginata*, *G. muscolignosa*, *G. unicolor*, *G. vittiformis*.

Young, G.C. (2005). A new phyllolepid placoderm occurrence (Devonian fish) from the Dulcie Sandstone, Georgina Basin, central Australia. *Proceedings of the Linnean Society of New South Wales* **126**, 203-213.

A new phyllolepid placoderm occurrence from a low level in the Dulcie Sandstone, Georgina Basin, Northern Territory, lies about 200 metres stratigraphically above an older fish assemblage containing *Wuttagoonaspis*. A new species *Austrophyllolepis dulciensis* is characterised by an unusually broad anterior ventrolateral plate. The stratigraphic range of other species in this genus from southeastern Australia and Antarctica suggest a Givetian-Frasnian age. Early members of the order Phyllolepidia are endemic to east Gondwana, and other phyllolepidids of similar age occur in Turkey and Venezuela. In the Northern Hemisphere (Europe, Russia, Greenland, North America) phyllolepidids are restricted to the latest Devonian stage (Famennian). This disjunct space-time distribution for the group supports a Gondwanan origin for the Phyllolepidia, and later access to northern landmasses resulting from closure of the ocean between Gondwana and Laurasia at or near the Frasnian-Famennian boundary.