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Some Taxonomic and Nomenclatural Considerations on the Class Reptilia in Australia. A New Species of Freshwater Turtle in the Genus *Wollumbinia* Wells 2007 (Reptilia: Chelidae) from Eastern Australia.

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Introduction

Wells (2007a) recently redefined the genus *Elseya* Gray, 1867 and later erected the genus *Wollumbinia* for the *Elseya latisternum* complex (Wells, 2007b). In this earlier work it was pointed out that *Wollumbinia latisternum* as then defined was a likely species complex. However, one of the main impediments to identifying the various populations of *Wollumbinia latisternum*, has been the imprecise understanding of where precisely the Type material of *Elseya latisternum* - and another species long treated as a synonym of *latisternum* - *Euchelymys spinosa* actually came from. Cogger, Cameron and Cogger (1983) concluded that *Euchelymys spinosa* was representative of *Elseya latisternum* from Cape York Peninsula Qld, but this has been disputed by Cann (1998). He examined both of the Types (and provided photos of the Holotypes of both species (Cann, 1998: p.199)) and demonstrated the morphological distinctiveness of *spinosa* from *latisternum*. It is clear from both the original description of *latisternum* and the morphology of the Holotype, that the name *Elseya latisternum* is referrable to a population from far north-east Queensland. The characteristics of the Holotype of *Euchelymys spinosa* however, are more consistent with the southern populations of *latisternum* in its possession of enlarged neck tubercles and more rounded carapace shape. However, there are some peculiarities of *Euchelymys spinosa* that have yet to be detected in any known population of *latisternum*. Cann believes on the basis of the original collection history, that *Euchelymys spinosa* may actually have been originally collected in the Burdekin River or perhaps from a river further south in south-eastern Queensland. For the present however, the precise Type Locality of *Euchelymys spinosa* remains unknown, but I agree with John Cann that this species must be referrable to a more southern *latisternum* population.

While carrying out field work in the northern rivers region of New South Wales I was able to collect two species of turtles that I considered represented potentially undescribed taxa. I referred these species to John Cann - and he readily confirmed my suspicions as to their distinctiveness.

One of these species was referrable to the genus *Wollumbinia* and the other to the genus *Emydura*. The *Wollumbinia* species is herein described as new. It has long been confused with *Wollumbinia latisternum* of north-eastern Queensland, despite differing in carapace and plastron shape, its smaller maximum size, a distinctive reduction of carapace serrations, a different head shape, as well as various conspicuous differences in scutellation. A comparison was also immediately made with *Euchelymys spinosa* of Gray 1871 because of the presence of enlarged neck tubercles, but I have concluded that, although closely related to the new species, *Wollumbinia spinosa* nov. comb. (Gray, 1871) differs from it in its possession of larger tubercles, a proportionally much larger head, with a more acute snout, and a smaller tympanum. A comparison with all other species of *Wollumbinia* also clearly demonstrated its distinctiveness. Cann who is familiar with the holotype of *spinosa* is also adamant that the new species herein described is not referable to that species.

When discussing this species' ecology with another turtle expert in Queensland, Mr Marc Dorse, I was also able to deduce that this undescribed species was not confined to NSW but also occurred over a fairly wide area of sub-tropical eastern Australia, extending from the Richmond River system in NSW, through south-eastern Queensland to about Brisbane. In

recognition of his fine contributions to public education and herpetology, I have pleasure in naming this new species of turtle for Mr Dorse:

Wollumbinia dorsii sp. nov.

Holotype: An adult female in the Australian Museum, Sydney, NSW – AM R172224. Collected by Richard W. Wells in the Richmond River, near Wiangaree, New South Wales on 6 December, 2008. The holotype was taken active at 1500 hrs in 1-2 metres water depth in a riffle zone over a mixed sediment bottom of basalt, sand and flood silt.

Description of Holotype: An adult female (see Figures 1 and 2) with a Carapace length of 203.0 mm X width of 163.5mm, X depth of 63.0 mm; Vertebrals: C1 (length X width in mm.) – 34.0 X 40.3; C2 - 34.5 X 48.5; C3 – 33.5 X 52.5; C4 - 35.5 X 44.0; C5 – 36.5 X 47.0; Plastron length 172.0 mm X width at front lobe 85 mm, and 79 mm at rear lobe; Plastral plates - Intergular length 30.5 mm; Humeral length 0.5mm; Pectoral length 37.0 mm; Abdominal length 16.5 mm; Femoral length 35.0 mm; Anal length 30.3 mm. Head width 40.5 mm; *Scalation:* Vertebrals - 5; Costals - 8; Marginals - 24; Nuchal – absent. Colouration in life – Head and neck basically dark slaty grey, with the dorsum of the head tending to be heavily blotched with black over a pale creamish-yellow head casque that extends laterally to above the tympanum. Carapace blackish, plastron base colour creamish-yellow anteriorly with blackish flecking, progressively overlain by a heavy black suffusion medially and posteriorly. Bridges dark brown with black streaks, flecks and edging. The ventral surfaces of the marginals are creamish-tan, heavily blotched with black – more-so posteriorly.

Diagnosis : A moderately large freshwater turtle of the Family Chelidae, of the genus *Wollumbinia* Wells 2007 and assignable to this genus by the absence of a distinct median alveolar ridge on the upper jaw - which is present in all species of *Elseya*. Readily separated from all other species of *Wollumbinia* by the following combination of character states: In *Wollumbinia dorsii* the mature carapace is rounded in shape (vs elongated in *Wollumbinia latisternum*); hatchling carapace morphology ovate in appearance, with a distinct vertebral keel (but all trace of the vertebral keeling of the carapace is lost with maturity- replaced with a moderate central vertebral groove); nuchal shield may be present or absent - but when present, usually very narrow; rear marginals of carapace are moderately to sharply serrated when young but this posterior serration to the carapace becomes much reduced to a smoothly ragged edge (vs serrations prominent throughout life, and largely retained as a jagged edging into adulthood in *Wollumbinia latisternum*). The plastron is relatively large with a very rounded anterior lobe, which in some specimens may extend to about the level of or just slightly beyond the carapace when viewed from above. The plastron in *Wollumbinia dorsii* also tapers strongly towards the posterior to a much greater extent than in *Wollumbinia latisternum.* In *Wollumbinia latisternum* the plastron is relatively larger at both the posterior and the anterior parts and the plastron tends to project significantly beyond the carapace anteriorly; intergular usually narrower than the adjacent gulars (vs about as wide as, or wider than the adjacent gulars in *Wollumbinia latisternum*; Head strong in appearance, fairly broad and deep (but generally smaller than in mature *Wollumbinia latisternum*), with a relatively wide mandibular symphysis in maturity and without a distinct median alveolar ridge on the upper jaw; horny plate (casque) on top of the head extends well off the dorsal of the head down to as far as the tympanum; usually two, but sometimes 3 or 4 small grey barbels under the chin (barbels 2-4, smaller and white in *Wollumbinia latisternum*); snout very prominent (vs more rounded and less prominent in *Wollumbinia latisternum*), dorsal part of the neck is covered with much enlarged sloping tubercles – interspersed with a scattering of wart-like protuberances on the upper neck region (vs a lower number of smaller distinctly pointed tubercles in *Wollumbinia latisternum*); limbs without a distinct line of white coloured enlarged scales on hind limbs (vs white limb scales present in *Wollumbinia latisternum*). This new species attains a maximum carapace length of about 230mm with females being larger than males (vs about 300 mm in *Wollumbinia latisternum*) and it does not exude the characteristic musk odour of *Wollumbinia latisternum*.

Fig 1. Dorsal View of Holotype of *Wollumbinia dorsii* sp. nov in life. Sexually mature adult female. Note smaller head with its pronounced snout, and lack of nuchal shield; the carapace is more evenly rounded, and lacks the prominent serrations to the posterior margins that are present in *Wollumbinia latisternum*. Photo courtesy of John Cann.

Fig. 2. Ventral View of Holotype of *Wollumbinia dorsii* sp. nov in life. Note the relatively broad, rounded anterior of the plastron, barely extending beyond carapace, plastral suture pattern and its narrow, tapering posterior portion. Photo courtesy of John Cann.

In colouration, *Wollumbinia dorsii* varies significantly from topotypic *Wollumbinia latisternum* and indeed from all other members of the genus *Wollumbinia*, with the possible exception of *Wollumbinia bellii*. In *Wollumbinia dorsii* the mandibles are pale creamish sometimes flushed with yellow, with a faint inclusion of darker grey in places; this paler facial colouration doesn't usually extend much beyond the jaws, with the side of the head and the anterior portion of the neck being greyish, tinged with greenish blue (vs yellowish-cream mandibles in *Wollumbinia*

latisternum that extends as a pale yellow or cream stripe along the side of the head, through the tympanum and along the neck to the forelimbs). The throat is fairly evenly coloured dark greyish in mature *Wollumbinia dorsii* whereas in *Wollumbinia latisternum* the dark greyish throat is usually suffused with creamish to yellowish speckling. The iris is heavily flecked with silvery-gold, with a pale gold inner ring in *Wollumbinia dorsii* (vs a coppery-gold iris, with a pale inner ring and a prominent black spot either side that almost splits the iris in *Wollumbinia latisternum*).The plastron colouration in *Wollumbinia dorsii* becomes progressively darker with blackish mottling and blotching over time, often being almost entirely black in maturity. In *Wollumbinia latisternum* the plastron is more uniform cream to yellowish, with only a faint suffusion of dark grey and thin dark edging to the plastral and marginal shields.

As mentioned above, there are also some superficial morphological similarities as well as significant differences between this new species and with populations of *Wollumbinia bellii* (Gray, 1844).

In physical appearance Dorse's Turtle shares some similarities with the usually larger *Wollumbinia bellii*. However, the carapace in *Wollumbinia dorsii*, although generally more rounded than in *Wollumbinia latisternum*, is much more so anteriorly than in *Wollumbinia bellii,* where the carapace tapers and narrows strongly anteriorly rather than presenting a smooth curve to the shell as in *Wollumbinia dorsii* or *Wollumbinia latisternum*. In *Wollumbinia bellii*, the rear marginals also flare slightly and are weakly serrated in mature specimens as in *Wollumbinia dorsii* (but the rear marginals tend to lack this posterior flaring in mature *Wollumbinia dorsii*); the body form is relatively deep in *Wollumbinia dorsii* (vs rather flat in *Wollumbinia bellii*). Interestingly, the carapace size, shape and marginal serration state of *Wollumbinia dorsii* is more similar to the Bald Rock Creek, Qld population of *Wollumbinia bellii* [*Wollumbinia bellii dorriani* (Wells 2002)] than it is to the condition found in the nominate populations of *Wollumbinia bellii*.

Hatchlings of *Wollumbinia bellii* have the central shields of the carapace only slightly ridged (hatchling ridging stronger in *Wollumbinia dorsii*), and juveniles of *Wollumbinia bellii* have barely any serrations along the rear marginal shields (posterior marginals noticeably serrated in juvenile and immature *Wollumbinia dorsii*). The plastron of *Wollumbinia dorsii* is somewhat similar to that of *Wollumbinia bellii* in that the anterior plastral lobes extend to the edge of the carapace or slightly beyond and are broad and rounded in mature specimens of both species, However, the posterior of the plastron is straighter and slightly more tapered into the anal shield in *Wollumbinia bellii* than is the case in *Wollumbinia dorsii*. Additionally, in all populations of both *Wollumbinia bellii bellii* and *Wollumbinia bellii dorriani*, the anal shields are usually the longest, whereas in *Wollumbinia dorsii* the pectorals are the longest.

As in *Wollumbinia dorsii*, the colour and patterning of *Wollumbinia bellii* can be rather stunning when young but the brighter, lighter colouration and patterning of juveniles becomes much reduced with age in both species. Both species when mature may become almost entirely black over the carapace and plastron, with only faint traces of their younger patterning of radially black blotching on a brown base once maturity is attained. In colouration juveniles of *Wollumbinia dorsii* have distinctive a pale reddish-brown carapace that is heavily flecked and blotched with black, and the plastron is creamish-yellow. The head is dark brown, with fine black reticulations or fleck; the mandibles are pale creamish, and this is continuous with a short yellowish line or stripe that extends to the posterior of the head – or occasionally continued further as a broken stripe on part of the lower neck. These colours gradually darken with age, with the dorsum of the carapace becoming a richer brown in sub-adults, with the edges of the plates being edged with black lines; many specimens can have black spotting or streaks as well. The plastron gradually darkens with increasing suffusions of black, to become almost completely black by maturity. In *Wollumbinia bellii*, juveniles are similarly brightly coloured, with the carapace being brown with dark greyish mottling. There is a light yellow neck stripe that extends from the back of the mouth (where it is widest) and, unlike *Wollumbinia dorsii*, it extends right along the lower lateral of the neck and through the tympanum to about the forelimb in *Wollumbinia bellii* - but with age, this stripe becomes much less distinctive. The gular region and ventral part of the neck is similar in colour to the neck stripe, sometimes vaguely mottled with greyish patches, but as males grow this neck stripe and under-body colour may take on a pinkish hue as well. The ventral part of the tail has a bright yellow hue as does the bridge between the carapace and plastron and some of the marginals (under-surface). In hatchlings, the plastron is yellowish (or sometimes a yellowish-green) with extensive patches of dark grey throughout, and the limbs and exposed upper skin surfaces are steel-grey. By about 150 mm carapace length the plastral colour becomes

progressively darker, with aged specimens being almost totally black ventrally as in *Wollumbinia dorsii*. Mature *Wollumbinia bellii* are similar to *Wollumbinia dorsii* in their tendency to become more melanistic with age. In *Wollumbinia dorsii* the pupil is black, with a silvery-gold iris delicately flecked with black, and a pale inner ring. The iris colour of *Wollumbinia bellii* on the other hand changes with age - hatchlings have an iris of golden yellow with brownish mottling, but may change to greyish-silver, with a variable pale inner ring, and a dark outer ring. Mature specimens of *Wollumbinia bellii* may also have a dull olive-green iris, with a light inner ring and a darker outer ring, in marked contrast to the condition in *Wollumbinia dorsii*. The barbels are greyish to pale cream in both *Wollumbinia dorsii* and the nominate form of *Wollumbinia bellii* – however, the barbels are yellow in *Wollumbinia bellii dorriani.*

A comparison of Wollumbinia dorsii with Wollumbinia purvisi (Wells and Wellington, 1985) or *Wollumbinia georgesi* (Cann, 1997) is hardly necessary given their morphological distinctiveness (see Cann, 1998; Wells 2007b). The unique presence of neural bones in *Wollumbinia purvisi* immediately separates this species from *Wollumbinia dorsii.* The upper neck is strongly covered in enlarged pointed tubercles in *Wollumbinia dorsii* a situation very different to that of *Wollumbinia georgesi* where the dorsum of neck skin is weakly covered with low tubercles. Further, the head shield or casque is patterned with paler markings and keratinised in surface texture in *Wollumbinia dorsii*, but the casque is smooth, and evenly dark-coloured in *Wollumbinia georgesi* a feature unique in the genus *Wollumbinia* with the exception of the similar situation in *Wollumbinia purvisi.*

Distribution: As herein defined, *Wollumbinia dorsii* is found in sub-tropical coastal eastern Australia in a restricted area from about Brisbane, south-eastern Queensland to north-eastern of New South Wales, as far south as the Richmond River.

Habitat: *Wollumbinia dorsii* generally favours freshwater creeks, or billabongs or slow-flowing relatively shallow rivers with rocky and/or sandy beds in sub-tropical regions. It occurs in permanent-flowing rivers, as well as second or third order streams and their associated lagoons and billabongs. During drought conditions some water bodies inhabited by this species may dry to a series of isolated ponds, where rather large populations can occur. Upon the onset of rains and the restoration of flow, the chains of water holes merge into continuous streams once more and populations disperse more widely. Essentially diurnal in habits, *Wollumbinia dorsii* will bask on exposed logs or boulders that protrude from the water, or even on banks at the water's edge. When disturbed, they will rapidly dive into the water and quickly swim to the bottom or escape under overhanging banks, or into submerged crevices of rocks or log-piles. This is a shy, fast-swimming species that generally avoids shallow, clear waters that are less than 1 metre in depth during daylight, however during the evening they will move out of protected areas of deeper water or from under river banks out into the shallower waters to forage. When found in permanent rivers, it seems to prefer headwater areas or the upper faster flowing reaches, where the habitat may have deeper undercut banks, or rocky, boulder-strewn courses, often with sandy or rocky bottom sediments, with snags and rapid or riffle zones at depths of around 1-2 metres. In such situations, they have been observed foraging near the riffle zone as well as around the associated slower flowing margins and backwaters. In the Richmond River, in north-eastern NSW, large specimens have been observed by the author sitting on the bottom amongst basalt rocks in riffle zones or rapids, where their black carapace colouration allowed excellent camouflage. Areas of less permanent or more seasonal water flow also occupied by this species - such as along second or third order streams and their associated ponds as on the Gold Coast in south-eastern Queensland – tend to have somewhat larger populations living quite successfully in deeper water depths of around 3 or 4 metres, but in such situations, they tend to be observed closer to the shallower margins of such water bodies, rather than in the deeper more open areas of water.

Biology/Ecology: Although countless numbers of this species over recent years have found their way - as juveniles and adults - into the pet trade under the name of *latisternum* with which it has been previously confused, very little has been published on the breeding biology of what is now known as *Wollumbinia dorsii*. It is known that around 10-15 eggs are laid in a clutch and a number of separate clutches may be produced each year by a single female. The eggs hatch after about 2 months of incubation. Nothing is known about the age of sexual

maturity or its longevity. Given its size and growth rate of those that I have in captivity, it is likely that 5-10 years might be required for sexual maturity to be attained, and I consider that a potential maximum life span could exceed 50years. This is an essentially carnivorous species that mainly consumes a wide range of invertebrates as well as small vertebrates; although some plant matter will also be taken. I have observed this species readily seizing beetles that fall into the water from overhanging vegetation, and they will also consume virtually any aquatic species including small crayfish and even dragonfly larvae as well. Vertebrates such as small fishes and amphibians – both as frogs and tadpoles – are readily hunted and seized in their jaws and quickly shredded with the long sharp front claws if the prey item is too large to swallow whole. Their diet also includes small Cane Toads and their tadpoles apparently without ill-effect. A significant component in this species diet is also carrion. Any dead animal in the water soon attracts numbers of *Wollumbinia dorsii* and with their powerful jaws and long, sharp claws they have little difficulty gradually tearing apart even fairly large carcasses.

Survival Status: *Wollumbinia dorsii* (currently under the name *Wollumbinia latisternum*) is protected under the New South Wales National Parks and Wildlife Act (1974) but not listed in that State as a Threatened Species in any of the Schedules of the NSW Threatened Species Conservation Act (1995). It is also protected under the Queensland Nature Conservation Act (1992).

Etymology: Named for Mr Marcus Dorse educator/herpetologist of Mount Tamborine Queensland.

The genus *Wollumbinia* now comprises the following content: *Bell's Turtle, Wollumbinia bellii bellii* (Gray, 1844); Dorrian's Turtle *Wollumbinia bellii dorriani* (Wells, 2002); Georges' Turtle, *Wollumbinia georgesi* (Cann, 1997); Saw-shelled Turtle, *Wollumbinia latisternum* (Gray, 1867); Purvis' Turtle, *Wollumbinia purvisi* (Wells and Wellington, 1985); *Wollumbinia spinosa* (Gray, 1871) and Dorse's Turtle, *Wollumbinia dorsii* this paper.

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