

**OBSERVATIONS ON THE DIET AND FEEDING HABITS OF
THE SHORT -BEAKED ECHIDNA (*TACHYGLOSSUS
ACULEATUS*) IN TASMANIA**

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Data on feeding habits and invertebrate species eaten by Tasmanian echidnas have been collected over a number of years from direct observation of foraging individuals, both in field and captivity. The captive and extremely willing 'Puggles' (Trowunna Wildlife Park) provided the perfect opportunity to record detailed observations at very close range as she fed on invertebrates that were exposed to her by the rolling of stones and decaying wood on our many rambles into the bush during the filming of a wildlife documentary. This information has been supplemented by data collected from gut contents of road-killed specimens and from faecal sample analysis. Gut contents and faecal samples from road-killed animals were collected *in situ* and later processed in the laboratory along with faecal samples collected from latrine sites.

Echidnas in Tasmania occur Statewide and forage across all habitat types from the coast to alpine moors, gathering food as they wander in what appears to be a totally random fashion. They employ a number of strategies to maximise their capacity to capture and ingest food.

The beak is extremely sensitive to even the slightest touch and yet is a strong durable crow bar with a chiselled tip for prying apart decaying logs, as well as lifting and rolling logs and stones. A keen olfactory sense is put to good use as the foraging animal samples decaying logs, searches beneath stones and explores around and inside the bases of trees and dead stumps, often standing on hind legs as they reach up to sample the odours issuing from a log or tree. This method of foraging is an apparently effective strategy, as small mobile invertebrates are typically cornered in small cavities where escape is impossible and are drawn into the mouth, adhering to the tongue (Plate 1). In Tasmanian animals the organ can be up to 18 cm in length, which compares favourably with its mainland counterpart (Rismiller 1999). The tongue is strongly adhesive, extremely flexible and barbed with encircling ridges throughout its length, culminating in a hard pointed tip. This organ is superbly suited to process the food items targeted by the species, the generic name of which translates as 'fast tongue'.



Plate 1. Echidnas are not shy, and not much will escape this tongue! (© D. Parer & E. Parer-Cook).

Tasmanian echidnas eat a wide range of invertebrates, including some hard items. For example, native snails up to 12 mm diameter are taken, as are some potentially harmful items including arachnids, wasps, and stinging ants. Echidnas approach these food items by first crushing them using downward pressure from the beak before the body is repeatedly pierced with the tongue which removes gut contents and bodily fluids, reducing the prey to an ingestible size. Observations also indicate that echidnas are able to suck quite strongly, drawing in soft items that do not readily adhere to the tongue (e.g. slugs).

Despite having a keen olfactory sense, as previously recorded (Augee & Gooden 1993), Tasmanian echidnas are not put off by strong scent and appear to relish odoriferous animals. Dipteran larvae (maggots) exiting a decaying carcass are greedily taken, as are rove beetles, millipedes and mole crickets, the latter three of these invertebrate groups are all known to be distasteful to most other predatory species.

In addition to ingesting invertebrates, echidnas also consume large quantities of soil and exhibit a preference for gritty sand and fine gravel. On numerous occasions, ‘Puggles’ was observed greedily eating grit containing no food matter: such behaviour may aid in digestion, supply additional mineral salts or simply bulk up the scats, which are often composed of up to 70% soil. Echidna scats are not randomly deposited whilst foraging, instead, they are usually excreted in well used

latrine sites (Sprent *et al.* 2006), which may be situated beneath boulders or large logs and within hollow logs (Grove *et al.* 2006). Latrine sites have been found to be used over extended periods by multiple individuals, seemingly as communal privies or meeting places (Plate 2).



Plate 2. Echidna latrine site at Maquarie Settlement (photo: C. Spencer/K. Richards).

The claws of the pes are curved sharply outwards and though used to some degree in excavating; their design appears to be primarily for scratching and grooming between the spines. The manus is equipped with very tough spade like claws that provide anchorage when bulldozing soil or debris aside and are also used to tear apart decaying wood, digging in search of food, or to escape predators as well as for climbing. In Tasmania, reports indicate that echidnas have been observed climbing over vertically over one metre high up cage wire in captivity (observation cited in Wapstra *et al.* 2000), which supports the mainland finding that in captivity they have scaled 2 metre high wire mesh barriers (Augee & Gooden 1993).

Utilising their highly evolved intelligence (Rismiller 1999) echidnas have developed diverse feeding strategies that enable them to cope with rugged terrain, potentially harmful prey and extreme environmental variables. Tasmanian echidnas have been found to consume a wide range of invertebrate fauna. Table 1 lists the species identified as prey by the authors to date.

Table 1. List of invertebrate species identified as prey of the Tasmanian echidna.

Species	Common name	Life stage of prey					Data source		
		Larvae	Adults	Eggs	Juv.	Pupae	Obs.	Guts	Faeces
Beetles									
<i>Pyrgoides orphana</i>	fireblight beetle		*				*		*
<i>Diphucephala colaspoides</i>	green scarab beetle		*				*	*	*
<i>Toxyutes arcuatus</i>	longhorn beetle	*				*	*		
<i>Lamprima aurata</i>	golden stag beetle	*				*	*		*
<i>Chrysopharta nobilitata</i>	leaf beetle		*				*	*	
<i>Chrysopharta agricola</i>	leaf beetle		*				*		
<i>Chrysopharta bimaculata</i>	leaf beetle		*				*		
<i>Paropsis aegrota elliotii</i>	leaf beetle		*				*		*
<i>Phyllotocus rufipennis</i>	nectar scarab beetle		*				*	*	*
<i>Anoplognathus saturalis</i>	christmas beetle		*				*		
<i>Pharochilus politus</i>	passalid beetle	*					*		
<i>Aphodius tasmaniae</i>	pasture chafer beetle	*	*			*	*		*
<i>Aphodius howitti</i>	pasture chafer beetle	*	*				*		*
<i>Adoryphorus couloni</i>	chafer beetle	*					*		
<i>Heteronyx obesus</i>	chafer beetle	*					*		
<i>Diphucephala colaspoides</i>	green scarab beetle		*				*	*	
Staphylinidae	rove beetle		*				*		
<i>Coripera deplanata</i>	ground beetle	*	*				*	*	*
Carabidae spp.	carab beetle	*					*		
<i>Syndesus cornutus</i>	stag beetle	*	*			*	*	*	
<i>Lepispilus sulcicollis</i>	ground beetle	*	*				*		*
<i>Lissotes launcestoni</i>	stag beetle	*				*	*		
<i>L. obtusatus</i>	stag beetle	*	*			*	*	*	
Ants									
<i>Myrmecia forficata</i>	bull ant	*	*	*		*	*	*	*
<i>M. esuriens</i>	bull ant	*	*	*		*	*		*
<i>M. fulvipes</i>	jack jumper	*	*	*		*	*		*
<i>M. pilosula</i>	jack jumper	*	*	*		*	*	*	*
<i>M. urens</i>	jack jumper	*	*	*		*	*	*	*
<i>Iridomyrmex</i> spp	ant	*	*	*		*	*	*	*

Species	Common name	Life stage of prey					Data source		
		Larvae	Adults	Eggs	Juv.	Pupae	Obs.	Guts	Faeces
<i>Amblypone australis</i>	ant	*	*	*		*	*		*
<i>Camponotus</i> spp.	ant	*	*	*		*	*	*	*
<i>Myrmeco-rhynchus</i> spp.	ant	*	*	*		*	*	*	*
<i>Cerapachys larvatus</i>	ant	*	*	*		*	*		
<i>Discothyrea bidens</i>	ant		*					*	*
<i>Hypoponera</i> spp.	ant		*					*	
<i>Platythyrea turneri</i>	ant	*	*	*		*	*		*
Termites									
<i>Prototermes adamsonii</i>	termite	*	*	*	*	*	*	*	*
<i>Kaloterms convexus</i>	termite	*	*	*	*	*	*	*	*
<i>Stoloterms brunneicornis</i>	termite	*	*	*	*	*	*		*
Moths									
<i>Aenetus ligniverens</i>	green swift moth	*	*				*	*	
<i>Xylutes literata</i>	wattle goat moth	*				*	*		*
<i>Oxycanus diremptus</i>	swift moth	*	*			*	*		*
<i>Oncopera intricata</i>	corbie grub	*	*			*	*	*	*
<i>Spodoptera mauritia</i>	army worm	*	*			*	*	*	
Flies									
<i>Musca vetustissima</i>	bush fly	*					*		
<i>M. domestica</i>	house fly	*					*		
<i>Dasybasis</i> spp.	march fly	*					*		
Crickets									
<i>Gryllotalpa australis</i>	mole cricket		*		*		*	*	
<i>Kinemania ambulans</i>	raspy cricket		*		*		*	*	
Slaters and earwigs									
<i>Porcello scaber</i>	slater		*		*		*	*	*
<i>Forficulata auricularia</i>	European earwig		*		*		*		*
Wasps									
<i>Vespula germanica</i>	European wasp		*						*
Slugs									
<i>Arion intermedius</i>	hedgehog slug		*				*		

Species	Common name	Life stage of prey					Data source		
		Larvae	Adults	Eggs	Juv.	Pupae	Obs.	Guts	Faeces
<i>Cystopelta petterdi</i>	slug		*				*		
<i>Deroceras caruanae</i>	slug		*				*		
<i>Deroceras reticulatum</i>	slug		*				*		
Snails									
<i>Tasmaphena</i> spp.	snails		*				*		*
Flatworms									
<i>Temnocephala</i> spp.	flatworm		*				*		
Scorpions									
<i>Cercophonius squama</i>	scorpion		*		*		*	*	*
Spiders and harvestmen									
<i>Delena cancerides</i>	hunterman spider		*	*	*		*	*	
<i>Littodamus olga</i>	red & blue spider		*				*		
<i>Lycosa tasmanica</i>	wolf spider		*	*	*		*		
<i>Badumna insignis</i>	black house spider		*		*		*		
<i>Pholcus phalangioides</i>	harvestman		*				*		
Millipedes									
<i>Spirostrepsida</i> spp.	millipede		*				*	*	*
<i>Polydesmida</i> spp.	millipede		*				*		*

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