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NOTES ON THE DISTRIBUTION AND HABITAT OF THE TASMANIAN LAND MOLLUSCA

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Summary :

Scientists have long been aware of widespread relationships between Tasmanian land mollusca and that of other parts of Australasia. In the past the distribution of the 'Tasmanian' forms was attributed to climatic variation. Hedley (1896) reported a Tasmanian colony "stranded on Mt. Kosciusko". Land bridges were postulated to account for relationships with New Zealand. Re-definition of the species tended to obscure these affinities in the opinion of various workers.

Much more is known about the fauna, together with increased knowledge of climatic and geologic features influencing migration. Some notes are offered here on habitat and relationships, with brief comment on some associated problems.

Introduction:

In eastern Australia Iredale (1937) recognised the Euronotian Faunulae and the Bassian Faunulae based on his studies of land mollusca. The latter faunulae were to be found from southern Queensland to Tasmania. He noted New Zealand affinities but tended to give reduced importance to these.

Obvious resemblances between Victoria and Tasmania, coupled with the presence of the Tasmanian aborigines, gave an early stimulus to the idea of possible land bridges across Bass Strait. Hedley (1896), intrigued by his finds on Mt. Kosciusko, suggested that a continuous fauna with Tasmania governed by climate was indicated. He felt that a glacial epoch, evidence of which was being noted by geologists, stimulated migration of Tasmanian molluscs. The withdrawal of the climate reversed the migration leaving some of their members stranded on the mountain heights.

But this did not explain the affinities with New Zealand and with other parts of Australia. Why did not a bold and active snail like Caryodes dufressnii find its way into Victoria (Kershaw & Dartnall, 1972). How does one account for the presence of Bothriembryon (Tasmanembryon) tasmanicus in Tasmania when all its relatives are in Western and South Australia. In fact, there was a tendency to look for eastern Australian relatives for this snail.

Land Snails in Tasmania

Iredale referred in several of his papers on land mollusca to the preference for dry conditions by his family Paralaomidae (now known to belong to the family Punctidae). The idea was based at first on the finding of individuals of the genus Paraloama Iredale 1913 on the surface of dry rocks. Later other species were also found in dry situations. The family Punctidae with the other group of very small snails of family Charopidae make up a large proportion of the Tasmanian snail fauna. It is not always easy to tell them apart. It would be helpful if habitat was a guide, particularly as the Charopidae were claimed to prefer moist conditions. However I soon found that it would be unwise to rely on such a rule in Tasmania.

There is of course some truth in these claims. But as Iredale pointed out himself, Australian snails aestivate during the dry periods of summer or drought Dryness is then a relative term when applied to snail habitat. Thus, in wet Tasmanian forests snails may be found during most of the year. In dryer eastern and midland localities they may not be in evidence for months at a time.

A damp situation in snail terms is one then where rainfall reliability is high or drainage and vegetation provide a suitable habitat. Thus, the Gippsland Lakes region of Victoria has a low rainfall with high reliability which encourages the presence of charopid species. On the other hand, although the sand dunes of the Furneaux Group have similar rainfall, other factors are entirely different.

How then could charopids live in this situation, as they do, if they are adapted only to very moist conditions. Perhaps interdune swales provide pockets from which snails could move onto the dunes when conditions became suitable. However, I have found species of the family on dunes in north eastern Tasmania where no convenient pocket existed. All they seem to need is plenty of litter and shelter. It seems apparent then that care is needed in defining the habitat even of individual species.

It would be incorrect to infer that every tiny species found in a damp situation belongs to the Charopidae. In one such situation careful search revealed only one species of Pernagera but a number of species of the Punctidae, as well as other snails. This was in rain forest near Tarraleah in Central Tasmania. In fact all Tasmanian collectors have been aware of this distribution. Punctidae can and do occupy dryer situations than many Charopidae, but may also occupy closely similar situations. Thus the Punctid snail Trocholaoma lives in fern gullies in north western Tasmania. But, as Iredale has pointed out, the tiny Charopidae are never exposed and he used the term cryptozoic life for them.

Shelter then is the operative factor for it is obvious that species of Pernagera and Discocharopa survive in relatively dry situations. Geminoropa by comparison is a genus of the wet forests of Tasmania and New Zealand.

I have experimented with the native slug Cystopelta which, lacking a shell, could be susceptible to dryness. It is found in wet forests on Mt. Barrow, in tea tree 'swamps' and in sclerophyll forest near the Tamar River. My observations were carried out in the latter area (Kershaw, 1957). Slugs allowed air but not moisture survived only for 24 hours, but in the absence of both, less than 3 hours. Helicarion by comparison remained alive in a matchbox for a week, but less than 3 days in an airtight tin.

In this area of variable rainfall the summer may be long and dry. Cystopelta survives such conditions for in 1955 with higher than normal rainfall it was very plentiful.

A search was therefore made during the summer for a suitable habitat which would enable survival. This proved to be a depression filled with a mulch of rotting leaves where the soil remained moist for long periods. Here was Cystopelta curled up well below the dry surface providing for the future breeding stock of the species.

In this area the Charopidae were represented by a species of Elsothera as well as large forms formerly placed in the Family Flammulinidae. In some places there were many Punctidae, Helicarion and the predator Strangesta. Hence if the habitat provides enough moisture for survival of breeding stock the species survive. It is not enough to look at the family but rather at the genus or the species in study of the habitat. In Tasmania it is not difficult to find evidence that many species survive a very wide range of conditions, while some are very selective.

Tasmania appears to have many natural boundaries to the spread of species. Various forms do appear to exist which have adapted to restricted habitat. Much has been made of geographical situation in allowing the validity of species in lists (Iredale, 1937). Victaphanta milligani does in fact live only in the rain forests of western Tasmania, Bothriembryon tasmanicus only in the eastern coastal country, and Anoglypta launcestonensis in the north eastern rainforest. Caryodes dufresnii has produced a giant rain forest form and a dwarf sclerophyll forest form.

Despite these examples most geographic determinations have been found misleading and a closer ecological study is required. There remains the similarity, perhaps not necessarily uniformity, of species between Tasmania and Victoria. Can this be due to Pleistocene migration? We have seen that this does not account for all the problems. In fact Tasmanian snails have adapted to a wide range of conditions which may be due to the glacial period. But the relationships seem to be much less easy to account for, much older than this. Species have been found over a wider range than originally thought. Hence the idea of isolated colonies of Tasmanian snails is not necessarily a valid one. The Pleistosene Epoch certainly saw variation in the range and nature of the habitat, which probably had a degree of associated snail migration. Conclusions on the significance of this are probably still premature. However it is known that the snail fauna is much older than was thought in the past (Solem, 1959). Hedley believed he was seeing specific relationships. Iredale, on the other hand, favoured family and generic levels separating Hedley's forms as distinct species. My own notes of the 1950's indicate that I favoured generic or group levels as indicative of migration paths, retaining the feeling that some genera may not be valid. But I accepted Iredale's genera of the Charopidae (Kershaw, 1954) as the most convenient means of studying these snails.

The increased understanding of the fauna, its distribution and age has provided emancipation from the necessarily restricted views of Hedley's day, but in his assessment of the relationships he may well have been nearer the truth than many later workers. Further, the new concepts being provided by geologists of Gondwanaland and the mechanism of plate tectonics provides a new light in which to view the still unsolved problems in Tasmania.

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LICHENS OF MT. FIELD NATIONAL PARK

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As part of a general survey of the lichens of Tasmania the National Parks are being studied in more detail. In this note a preliminary list is given of the lichens in the South-Eastern parts of the Mt. Field National Park. Some information is given, in abbreviated form, concerning the lichen type, abundance and substrate.

The abbreviations used are –

Fo = foliose lichen leaf like lichen
SFo = small foliose lichen = leaf like lichen of reduced size (3-5 mm)
Fr = fruticose lichen = lichen with stem or strand structure
SFr = small fruticose lichen = stem or strand structure visible only with X10 lens
C = crustose lichen = lichen almost inseparable from substrate
T = occurring on trees or bushes
R = occurring on rocks
S = occurring on soil
1 = abundant in study area
2 = common in study area
3 = uncommon in study area
4 = rare in study area

The work is incomplete and heavy emphasis is placed on the listing of the larger more easily observable lichens.

1. Lower Forest Areas - e.g. Tracks to Russell & Lady Barron Falls

Baeomyces fungoides	Fr, S, 2	Collema leucocarpum	Fo, T, 3
" heteromorphus	Fr, S, 2	Hypogymmia lugubris	Fo, T, 2
Cladia aggregata	Fr, S, 1	Peltigera dolichorrhiza	Fo, S, 2
" schizopora	Fr, T, 3	Pseudocyphellaria rubella	Fo, T, 3
Cladina leptoclada	Fr, S, 3	Sphaerophorus melanocarpus	Fo, T, 1
Cladonia cornuta	Fr, S, 3	Usnea xanthopoga	Fr, T, 2

N.B. This area has been badly damaged by human agency, also this is the most poorly sampled area. Hence a much greater variety is expected to be found after more detailed examination.

2. Mixed Forest - Horizontal + Eucalypts - e.g. immediately below "Forest Walk"

Cladia Schizopora	Fr, T, 3	Pseudocyphellaria rubella	Fo, T, 2
Collema laeve	Fo, T, 3	Psoroma du Rietzii	SFo, T, 2
" leucocarprum	Fo, T, 2	" contextum	SFo, T, 2
Menegazzia retipora	Fo, T, 2	" sphinctrinum	SFo, T, 1
Polychidium umhausense	Fr, T, 4	Sagenidium molle	SFr, T, 2
Pseudocyphellaria mougeotiana	Fo, T, 2	Sticta filix	Fo, T, 1
" pseudosticta	Fo, T, 1	Usnea capillacea	Fr, T, 1
" punctillaris	Fo, T, 4	" flexilis	Fr, T, 1
" rigidula	Fo, T, 4	" xanthopoga	Fr, T, 1

3. Nothofagus Forest - e.g. "Forest Walk"

Anzia angustata	Fo, T, 3	Pseudocyptiellaria cinnamomea	Fo, T, 1
Cladia aggregata	Fr, S, 1	" faveolata	Fo, T, 2
Cladina leptoclada	Fr, S, 2	" flowtowiana	Fo, T, 2
Cladonia subdigitata	Fr, S, 1	" rubella	Fo, T, 2
Leptogium tremelloides	Fo, T, 3	Psoroma sphinctrinum	SFo, T, 1
Menegazzia retipora	Fo, T, 3	Ramalina farinacea	Fr, T, 3
" weindorferi	Fo, T, 2	Sagenidium molle	SFr, T, 2
Nephroma australe	Fo, T, 4	Sphaerophorus melanocarpus	Fr, T, 1
Parmelia tenuirima	Fo, T, 3	" tener	Fr, T, 1
Pseudocyptiellaria billardierii	Fo, T, 2	Sticta filix	Fo, T, 1

4. Higher Eucalyptus Forest - e.g. Beattie's Tarn Track

Baeomyces fungoides	Fr, S, 2	Cladonia scabriuscela	Fr, S, 2
" heteromorphus	Fr, S, 2	" subdigitata	Fr, S, 2
Cladia aggregata	Fr, S, 1	" verticillata	Fr, S, 1
" retipora	Fr, S, 1	Hypogymnia billardierii	Fo, T, 3
" schizopora	Fr, T, 2.	" lugubris	Fo, T, 1
" sullivanii	Fr, S, 1	Lecidea cinnabarina	C, T, 2
Cladonia capitellata	Fr, S, 2	Peltigera dolichorrhiza	Fo, S, 2
" chlorophaea	Fr, S, 2	Placopsis parallina	C, R, 1
" cornuta	Fr, S, 2	Pseudocyphellaria pseudosticta	Fo, T, 1
" cornutoradiata	Fr, S, 2	Psoroma paleaceum	SFo, T, 2
" crispata	Fr, S, 2	Siphula decumbens	Fr, S, 2
" furcata	Fr, S, 2	Stereocaulon ramulosum	Fr, R, 1
" pleurota	Fr, S, 2		
" pyxidata	Fr, S, 2		

5. Remnant "Pine Grove - e.g. Lake Dobson

Note that "Pines" are rarely the substrate

Catillaria griffithii	C, R, 3	Pseudocyphellaria flotowiana	Fo, T, 2
Cladia aggregata	Fr, S, 2	" pseudosticta	Fo, T, 1
" retipora	Fr, S, 2	" rubella	Fo, T, 2
" sullivanii	Fr, S, 2	Psoroma contextum	SFo, T, 2
Cladina leptoclada	Fr, S, 2	" du Rietzii	SFo, T, 2
Collema leucocarpum	Fo, T, 1	" paleaceum	SFO, T, 2
Hypogymnia lugubris	Fo, T, 1	Psoroma soccatum	SFo, T, 2
Lecanora atra	C, R, 2	Siphula fragilis	Fr, S, 3
Leptogium burgessii	Fo, T, 2	Sphaerophorus melanocarpus	Fr, T, 1
Menegazzii foraminulosa	Fo, T, 3	" tener	Fr, T, 1
" weindorferi	Fo, T, 2	Sticta filix	Fo, T, 1
Peltigera dolichorrhiza	Fo, S, 2	" limbata	Fo, T, 4
" microphylla	Fo, S, 3	Stereocaulon corticatulum	Fr, R, 3
Pseudocyphellaria billardierii	Fo, T, 2	" ramulosum	Fr, R, 1
" crocata	Fo, R, 2	Usnea capillacea	Fr, T, 2
" flaveolata	Fo, T, 2		

6. Subalpine Moors - e.g. Tarn Shelf, Mt. Mawson Plateau, Field East & West Plateaux

Alectoria pubescens	Fr, R, 2	Parmelia conspersa	Fo, R, 2
Bilimbia sp	C, S, 2	" stygiodes	C, R, 3
Buellia wahlenbergii	C, R, 3	Pseudo cyphellaria crocata	Fo, R, 2
Cetraria islandica	Fr, S, 4	" pseudosticta	Fo, T, 1
Cladia aggregata	Fr, S, 1	Siphula complanata	Fr, S, 1
" " f. inflata	Fr, S, 4	" fragilis	Fr, S, 1
" retipora	Fr, S, 1	" moorii	Fr, S, 2
Cladina arbuscula	Fr, S, 2	Stereocaulon corticatulum	Fr, R, 2
Cornicularia aculeata	Fr, S, 4	" ramulosum	Fr, R, 1
Diploschistes scruposus	C, R, 3	Thammolia vermicularis	Fr, S, 1
Lepraria neglecta	C, S, 2	Umbilicaria cylindrica	Fo, R, 1
Menegazzia bullata	Fo, T, 2	Usnea glomerata	Fr, R, 1
" foraminulosa	Fo, T, 2		

7. Mountain Peaks - e.g. Mawson, Rodways, Field East, Seagers L/o, Field West

Agyrophora subglabra	Fo, R, 2	Placopsis gelida	C, R, 2
Alectoria pubescens	Fr, R, 3	Psoroma paleaceum	SFo, T, 3
Buellia wahlenbergii	C, R, 3	Rhizocarpon geographicum	C, R, 1
Cladia fuliginosa	Fr, S, 2	Siphula fragilis	Fr, S, 1
Diploschistes scruposus	C, R, 2	" moorii	Fr, S, 1
Lecanora atra	C, R, 2	Sphaerophorus tener	Fr, R, 3
Lecidea dicksonii	C, R, 2	Thammolia vermicularis	Fr, S, 2
Neuropogon acromelanus	Fr, R, 4	Umbilicaria cylindrica	Fo, R, 1
Parmelia signifera	Fr, R, 2	Usnea golmerata	Fr, R, 2
Pertusaria sp.	C, R, 2		

FLORA OF FRENCHMAN'S CAP NATIONAL PARK

D. Pinner

Family Myrtaceae	-	Leptospermum serviceum
		Calistomen viridiflorus
		Eucalyptus vernicosa
Family Ericaceae	-	Gaultheria hispida
Family Monimiaceae	-	Atherosperma moschatum
Family Fagaceae	-	Nothofagus gunnii
		Nothofagus cunninghamii
Family Eucryphiaceae	-	Eucryphia lucida
		Eucryphia milliganii
Family Escalloniaceae	-	Anopterus glandulosus
		Tetracarpaea tasmanica
Family Podocarpaceae	-	Phyllocladus aspleniifolius
		Pherosphaera hookeriana
		Microcachrys tetragona
		Dacrydium franklinii
Family Taxadiaceae	-	Athrotaxis selaginoides
Family Winteraceae	-	Drimys lanceolata
Family Proteaaceae	-	Cenarrhenes nitida
		Persoonia gunnii
		Bellendena montana
		Telopea truncata
		Lomatia tinctoria
		Lomatia polymorpha
		Banksia marginata

Family Epacridaceae	-	Prionotes cerinthoides
		Sprengelia incarnata
		Richea sprengelioides
		" procera
		" scoparia
		" dracophylla
		" pandanifolia
Family Gentianaceae	-	Gentianella diemensis
Family Cunoniaceae	-	Anodopetalum biglandulosum
		Bauera rubioides
Family Stylidiaceae	-	Stylidium graminifolium
Family Rhamnaceae	-	Spyridium gunnii
Family Scrophulariaceae	-	Euphrasia striata
Family Rubiaceae	-	Coprosma quadrifida
		" nitida
Family Leguminosae	-	
1. Mimosoideae		Acacia dealebata
		Acacia mucronata
		Acacia melanoxylon
Family Droseraceae	-	Drosera arcturi
Family Compositae	-	Helichrysum species
		Senecio species
		Brachycome species
		Ewartia catipes
Family Pittosporaceae	-	Billardiera longiflora

Macquarie