PLANT GALLS OF THE CANTERBURY REGION

By: Howard Lintott
University of Canterbury

Plant galls are so widespread that they are familiar sights to anyone interested in plants. Occasionally the causative agent is obvious, but usually it is too small or too transitory to be found, and one is left wondering. Galls are caused by a variety of organisms whose only common characteristics are the production of some stimulus of plant growth and a parasitic nature. Whatever its form, the gall is always derived entirely from the host plant's tissues, the parasite contributing nothing but the stimulus.

Many kinds of organisms can parasitize plants and form galls. The least specialised galls, in shape and internal structure, are produced as the result of infection by certain bacteria and fungi. Trees showing good examples of both of these galls are Acacias, where the roots have nodules containing nitrogen fixing bacteria, and the outer stems are disfigured by the large brown amorphous galls caused by the fungus Uromycladium tepperianum.

Other galls of relatively unspecialised structure are caused by nematode worms and mites. Numerous native plants are infected by Eriophyid mites - very small (0.1mm) colourless cylindrical creatures with two pairs of legs and mouth parts adapted to sucking the contents of single cells. Plants affected by mites show distortion and discoloration. Common examples are the large disfiguring bud galls in species of Hoheria, or the large green Witches Brooms on Plagianthus and Clianthus. On the credit side is the reduction in leaf size and number, and consequently in stinging potential, of Urtica ferox attacked by the mite Vittacus mansoni.

By far the largest group of gall causers are the insects. Four orders of insects, as follow, contain the majority of gall formers:

1. The Plant Bugs (Hemiptera and Homoptera) which include the aphids, the jumping plant lice (Chermidae = Psyllidae) and the scale insects (Coccidae). Certain aphids, by an ordered pattern of feeding, produce galls of intriguing form, such as the pouch galls produced by the females of Pemphigus on the petioles of poplar leaves.

   The gall causing Chermids, despite their common name of jumping plant lice, pass most of their lives as rather sluggish flattened insects with waxy coverings, which sit in one spot and suck. Species of Pseudopanax, Pittosporum and Olearia are often disfigured by their leaf dimple galls. Similar dimple galls are

produced by Coccids or scale insects which are even more sluggish, the female seldom moving from one spot. Examples of their galls can be found on leaves of Pseudowintera on Banks Peninsula.

2. Moths (Lepidoptera). The large swellings on Muehlenbeckia and, more rarely, on Parsonsia vines, are caused by the larva of Morova subfasciata tunnelling into the stems. As these galls continue to enlarge after the departure of the parasite they may become quite large.

3. The two-winged flies (Diptera) include a highly specialised family (Itonidae = Cecidomyidae), the gall midges, which form a great range of galls, mainly in the tropics.

Included among the diverse galls formed by the small midges are the bud-rosette galls common on Olearia paniculata, the swollen bud galls on Nothofagus trees, the woody stem galls on Carmichaelia, Coprosma, Hebe and Carpodetus, and the spectacular furry balls on Helichrysum glomeratum.

The Wasps (Hymenoptera). Apart from a few introduced species Canterbury has no representatives of the largest Northern Hemisphere gall causers. We have only one introduced Cynipid, the small black wasp Phanacis hypochoeridis which lays its eggs in the flower stems of the common rosette weed Hypochaeris radicata where their development causes the formation of prominent swellings. Probably because of their complex life histories which may have alternate sexual and asexual generations and last up to three years, none of the wasps causing the spectacular spangle-galls, bedegaurs, oak apples, etc., seem to have been introduced.

Similarly, only three of the Chalcid wasps which cause numerous galls on Australian plants have arrived here on Eucalypts.

A sawfly introduced with willows causes one of our most common galls, the red bean-galls found on the leaves of species of Salix. There are two generations each season. The larva lives within the gall and emerges to pupate under the bark. It is unusual in being one of the few larvae which provides a hole in the floor of the gall cavity through which droppings are pushed.

The following is a list of galls known from the Canterbury region. A check list of galls of New Zealand has been compiled by Lamb (1960). Undoubtedly there are many others awaiting discovery and the author would be grateful to receive or hear of any not listed here.

Winteraceae	
Pseudowintera colorata	
Leaf dimple gall	Coccid
Ranunculaceae	
Clematis indivisa	
Fungal stem gall	*Aecidium otagoense* (Rust fungus)
Violaceae	
Melicytus ramiflorus	
Flowers converted into leaf-like straps	*Aceria melicyti* (Gall mite)
Polygonaceae	
Muehlenbeckia spp.	
Woody stem gall	*Morova subfasciata* (moth)
Leaf pouch gall	Gall mite
Salicaceae	
Salix spp.	
Reddish leaf galls	*Pontania proxinia* (Hymenoptera - Sawfly)
Populus nigra	
Pouch galls on petioles	*Pemphigus bursarius* (aphid)
Haloragaceae	
Haloragis sp.	
Reddish bud and leaf galls	*Tegonotus haloragi* (Gall mite)
Thymelaeaceae	
Pimelea spp.	
Witches broom	Gall mite
Pittosporaceae	
Pittosporum tenuifolium	
Leaf dimple gall	*Trioza vitreoradiata* (Chermid)
Myrtaceae	
Eucalyptus spp.	
Stem galls	*Rhicnopeltella eucalypti* (Hymenoptera - wasp)
Leaf galls	
Flower capsule galls	*Flockiella eucalypti* (Wasp)

Leptospermum scoparium Witches broom	*Aceria manukae* (Wasp)
Eleocarpaceae *Eleocarpus dentatus* Leaf erineum (hairy outgrowths)	*Aceria dactylonyx titirangiensis* (Gall mite)
Malvaceae *Hoheria spp.* Large bud galls	*Eriophyes hoheriae* (Gall mite)
Plagianthus betulinus Witches broom	Gall mite
Escalloniaeceae *Carpodetus serratus* Stem, leaf or fruit gall becoming woody. Globular.	Gall midge
Grossulariaceae *Ribes spp.* Swollen buds and thickened leaves	*Eriophyes ribis* (Gall mite)
Rosaceae *Rubus spp.* Woody stem galls Leaf erineum	Gall midge Gall mite
Papilionaceae *Clianthus puniceus* Witches broom	*Aceria clianthi* (Gall mite)
Carmichaelia Spp. Cladode swelling Bud galls	*Uromycladium tepperianum* (fungus) *Uromycladium notabile* (fungus)
Mimosaceae *Acacia spp.* Brown shapeless galls	Gall midge Gall mite

Pilose (hairy) bud galls	Aceria carmichaeliae (gall mite)
Flower galls	Gall mite
Fagaceae	
Nothofagus solandri var. cliffortioides	
Leaf pouch galls	Aceria sp. (Gall mite)
Enlarged bud galls	Gall mite
Bud galls	Stephodiplosus nothofagi (Gall midge)
Witches broom	Aceria waltheri (Gall mite)
Moraceae	
Paratrophis microphylla	
Flower and bud galls	Gall mite
Urticaceae	
Urtica fern	
Pilose leaf galls	Vittacus mansoni (Gall mite)
Loranthaceae	
Elytranthe spp.	
Pocket gall on leaves	Unknown
Loranthaceae	
Korthalsella lindsayi	
Swollen inflorescence buds	Aceria sp. (gall mite)
Rutaceae	
Melicope simplex	
Leaf erineum (hairs)	Gall mite
Araliaceae	
Pseudopanax spp.	
Leaf dimple galls	Trioza irregularis (Psyllidae)
Ericaceae	
Gaultheria spp.	
Witches broom	Vasetes gaultheriae (Gall mite)
Epacridaceae	
Dracophyllum spp.	
Swollen bud galls	Eriophyes dracophylli (Gall mite)

Myrsinaceae	
Myrsine australis	
Terminal bud galls	Gall midge
Apocyanaceae	
Parsonsia spp.	
Stem gall	*Morova subfasciata* (Moth)
Rubiaceae	
Coprosma spp.	
Stem galls	*Kiefferia coprosmae* (Gall mite)
Leaf pocket galls	Gall mite
Flower galls	Gall mite
Pilose (hairy) grey bud galls sometimes forming short Witches brooms	*Aceria cottieri* (Gall mite)
Bud rosette gall	Gall midge
Compositae	
Cassinia fulvida	
Bud galls	Gall midge
Cassinia vauvilliersii	
Witches broom	*Eriophyes sp.* (Gall mite)
Celmisia coriacea	
Leaf galls	Gall midge
Helichrysum glomeratum	
Bud gall (furry ball)	Gall midge
Hypochaeris radicata	
Stem gall	*Phanacis hypochoeridis* (Gall wasp)
Olearia nummularifolia	
Terminal bud galls up to 20mm.	Gall midge
Olearia paniculata	
Bud or leaf rosette galls	*Oligotrophus olearíae* (Gall midge)
Leaf blister gall	*Dryomyia shawiae* (Gall midge)
Campanulaceae	
Wahlenbergia albomarginata	
Bud galls	Gall mite

Solanaceae	
Lycium ferocissimum	
Enlarged buds	Unknown
Convolvulaceae	
Calystegia spp.	
Leaf pouch galls	*Vasates calystegiae* (Gall mite)
Scrophulariaceae	
Hebe spp.	
Stem galls	Gall midge
Leaf galls	*Dasyneura hebefolia* (Gall midge)
Myoporaceae	
Myoporum laetum	
Stem gall	Gall midge
Witches broom and stem swelling	*Aecidium myopori* (Fungus)

(Families are listed in the order they appear in Allan's Flora)

REFERENCE:

K.P. LAMB, 1960. A Check List of New Zealand Plant Galls (Zoocecidia). Trans. Roy. Soc. N.Z. 88 : 121-139.

MANY HEADED CELMISIA

Celmisia spectabilis var. *magnificia*

Y. Elder

On one of my many enjoyable outings with the Editor and his wife, we went wandering up the Stour River in the Ashburton Gorge amongst the celmisias. Some of the members will know "the host" of white celmisias covering the hill-sides in this area. Not very far from the bridge we came upon a plant with multi-headed flowers, three or more capitula to a scape. In this clump there were about six scapes with several capitula on each.

Later, Dr. Moore and I returned to collect a specimen and seed and did a survey of about a half hectare in which we found five