# SOUTH AUSTRALIAN BUTTERFLIES
## *Data Sheet*

***Hesperilla chrysotricha cyclospila*** (Meyrick and Lower) (Chrysotricha Sedge-skipper)

Female

**Interesting aspects**: A large colourful skipper, which forms part of Australia's ancient endemic butterfly fauna, being confined to the cool temperate areas of Tasmania and southern mainland Australia. The female can be moth-like in appearance, especially when heavy with eggs. The skipper is very intolerant of wetland degradation, and is therefore a good indicator species for the environmental condition of saw-sedge wetlands. Its presence is a sure sign that the wetland is environmentally healthy, and its absence means that the wetland has suffered previous severe degradation processes. (The closely related but more common *Hesperilla donnysa* is an all purpose indicator for saw-sedge bearing wetlands in South Australia. It will tolerate considerable abuse. If it is not present then the wetland is in serious trouble).

Both sexes will, when new, fly close to the foodplant, with males tending to either set up territories on a foodplant tussock or they will cruise around the wetland, waiting or looking for newly emerged females to mate with. The males are not known to hilltop. The females, when they are new and very heavy with eggs (they emerge with 40-50 fully developed eggs), will initially stay near the foodplant upon which they were raised, to lay eggs. Later, after they are lighter after having offloaded some of the eggs, they will wander about the wetland or up and down the valleys, looking for foodplant in new areas upon

which to lay their eggs. Males will mate with females as soon as the latter emerge from their pupal cases and while their wings are still soft and unexpanded. This skipper often occurs with *Hesperilla donnysa*, another wetland skipper with larvae that feed on the tall saw sedges. In many coastal areas their flight periods do not overlap.

## Life History

**Larval food-host**: ***Gahnia deusta*** (mallee saw-sedge), ***G. filum*** (thatching grass or smooth-leaved saw-sedge), *G. radula* (thatch saw-sedge), ***G. sieberiana*** (red-fruit saw-sedge), ***G. trifida*** (cutting grass) (Cyperaceae). The larvae eat the leaves of the foodplant. The skipper has a preference for *G. trifida* on the mainland but on Kangaroo Island it is more often seen near *G. sieberiana*. It has been reported only once on *G. deusta*. The skipper requires its habitat and foodplant to be in full sun.

**Eggs**: Large (2 mm along the long axis), hemi-ellipsoid with a flat base, nearly smooth with about 54 very indistinct vertical ribs, the micropylar area on top of the egg is depressed. Pale green with a darker green micropylar area. If fertile the egg does not acquire purple or reddish markings as for *Hesperilla donnysa* and *H. idothea*. Laid singly or in pairs on the leaves of the foodplant, usually about 1/2 to 2/3 the way up from the base of the plant, within the inner parts of the (large tussock) plant. The egg hatches after about 11-14 days. The egg shell is eaten by the larva after its emergence.

**Larvae**: The first instar is long cylindrical, initially 5mm long, the forward half of the larva is pale green and the posterior half of the larva is yellow, but turning green after eating the foodplant, with a large shining black head having a few long hairs, the neck (prothoracic plate) is dark brown, and long recurved hairs occur posteriorly. After eating the empty eggshell the larva will eat a small portion of the foodplant to test that it is the correct foodplant, then it moves to near the tips of the leaves to form a small tubular shelter, by silking together two or three leaves.

Subsequent instars gradually acquire indistinct pale and dark longitudinal lines and lose the long posterior hairs, and the head becomes dark brown and eventually by about the fourth instar, acquires the pale brown head pattern described for the final (fifth) instar larva. New shelters are periodically constructed in the outer parts of the foodplant to fit the growing larvae, the internal diameter of the shelters being almost an exact fit to the diameter of the larvae. The shelters open at the top (towards the tips of the leaves) and during the development of the larva it will eat the leaves back from the tips towards the shelter entrance. In the case of this skipper, the leaves are usually silked together in a slightly twisted manner, whereas in other *Hesperilla* skippers the leaves are usually straight. Larvae feed at night for a very brief period (usually very late at night), hiding from predators during the day inside their shelters.

The final instar is long cylindrical, about 35-40 mm long, with the last posterior segment flattened into the anal plate, smooth, but with the posterior end having some hairs. Semi-translucent pale green, sometimes bluish or yellowish, with a darker dorsal line broadly edged whitish green, and sometimes there are other indistinct longitudinal lines. The head is large, finely rugose, elongate and slightly flattened, there is an indistinct central longitudinal furrow, the top is rounded, and there are a few long hairs ventrally and on the sides. Pale brown coloured with a narrow dark brownish black longitudinal median line in the front that expands ventrally and tapers to a point at the dorsal apex, and sometimes there

is an inverted pale brown coloured V mark immediately above the mouth, and with a small dark brown ventral blotch on either side of the head. (The side of the head never has a dark brown vertical stripe, which differentiates these larvae from other *Hesperilla* larvae in South Australia as they normally have lateral side markings). The body, and particularly the anal plate on the last segment, is covered in minute secondary setae that are hair-like with a blunt tip, and which are set on simple smooth raised bases. (This feature also differentiates these larvae from other *Hesperilla* larvae in South Australia as they have wine-glass shaped setae). The final larva shelter is constructed in the outer 1/3 of the plant, and is up to 7 cm long. Formed by joining up to six foodplant leaves together, to form a tight, silk lined slightly twisted tubular structure, sealed at the base and opening at the top.

Larval development is usually rapid in summer and autumn with most larvae attaining early fifth instar by winter. They continue to eat and develop slowly through winter, and pupation normally occurs in spring. (Dependant upon variable ecological factors, six larval instars may sometimes be required rather than the normal five instars).

The presence of larvae for this species (and for all other *Hesperilla* larvae) on the foodplant are readily discernible by the distinctive looping of the foodplant leaves resulting from the construction of the larval shelter. The leaves used in the construction of the shelter are tightly fixed by silk to form the shelter, and as the leaves continue to grow (from the base) the unequal growth rate of each leaf causes the fastest growing leaves to produce a loop beneath the shelter.

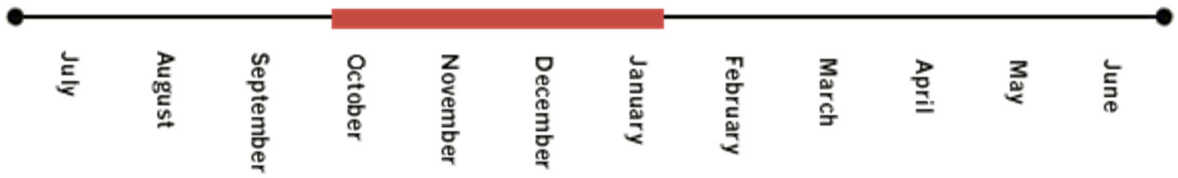
**Pupae**: Long cylindrical, about 25-30 mm long, usually brownish black with variable amounts of greenish or yellowish areas in the mid part, but sometimes they can be nearly all a greenish yellow colour except for a black head and posterior end, lightly covered in a white powdery bloom, the latter acting as a water repellent and perhaps fungicide. Sparsely covered with short black, stiff, posteriorly directed spinose bristles on the abdomen and dorsal part of the thorax, and which arise from short tubular bases. The bristles become much more common towards the posterior end. The posterior end tapers to a short, narrow, black rugose cremaster. The head is rounded, with the head cap (operculum) being black coloured, having a characteristic rounded shape, and there are some long hairs. The central part of the operculum is heavily sclerotised (very rugose ) and is divided into two parts, separated horizontally, with the dorsal part being the larger segment.

Pupation occurs in the final larval shelter on the foodplant, and the larva pupates head upwards towards the leaf tips. The pupa is secured within the silk lined shelter by very strong hooked bristles emanating from the terminal-ventral part of the cremaster, (same principal as velcro). The larva seals the top entrance to the shelter with a weak silken pad before it pupates, and which has to be broken by the emerging adult. The pupal duration is about 34 days. The empty pupal case remains inside the shelter after the adult skipper emerges, and is brown or brownish black coloured.

The shape of the operculum and cremaster, the colour of the pupa (alive or as an empty case), and the morphological properties of the larva or discarded larval skin (see above) are diagnostic for the species and can be used during field surveys to differentiate *H. chrysotricha* from other *Hesperilla* species in South Australia outside of the flight times for the adult skippers.

*Hesperilla* colonies are often plagued by the large, orange-red, parasitoid Ichneumonid wasp. The female wasp apparently lays her egg directly onto or into the skipper larva, and considering the tight, seemingly impregnable shelter made by the larva the wasp must inject the egg directly through the hard outer wall of the shelter by using her rigid external ovipositor. The wasp larva eats the internal organs of the skipper larva host, and eventually kills the skipper larva (and presumably any other parasitic larvae as only one parasitic wasp larva remains), and pupates inside the larval shelter after shrugging off the skipper larva skin. Judging from the size of the shelters this must occur when the skipper larvae are in their fourth or early fifth instars. Colonies of *H. chrysotricha* already under environmental stress are likely to be put into terminal stress by this wasp.

**Flight period in S.A.**: It is single brooded with the extended flight period across the state being about four months. However, individual population flights last only about one month. The flight starts about mid-October on Eyre Peninsula, but up to 6 weeks later elsewhere, with those occurring in the colder elevated areas of the Fleurieu Peninsula being the last to fly. In cold seasons the flight may be delayed by 2-3 weeks. Stragglers last into January, and there is a single flight record for late April.




**Distribution**: Its original range in South Australia included southern Eyre and Yorke Peninsulas, Kangaroo Island, the Fleurieu Peninsula, the Coorong, and the Lower Southeast region extending into southern Victoria and Tasmania. South Australian populations were formerly included under subspecies *leucosia* and ssp *naua*. They are now included under the single ssp *cyclospila*, although individual major populations in South Australia are reasonably distinctive. Another subspecies occurs in southwest Western Australia. Its range has been in a steady decline in South Australia, that has accelerated over the past 30 years. It is now extinct on Yorke Peninsula, and has been pushed to the extreme southern areas on Eyre and Fleurieu Peninsulas. It is probably extinct in the Coorong and is present only in a few coastal conservation parks in the Lower Southeast. On Kangaroo Island it is now mostly found on the western half of the island.


**Habitat**: In South Australia this skipper is confined to saw-sedge wetlands in the cool-temperate coastal and near coastal creek-line and upland spring environments.

**Conservation Status in S.A.**: Vulnerable. The mainland habitat of this skipper is now severely fragmented and degraded, due to urbanisation and agricultural use. The skipper shares the same coastal habitat as the endangered Orange Bellied Parrot and the Emu Wren, and their fates are now intricately linked. Population numbers of the skipper on the mainland are now extremely low where it rarely recolonises a previous habitat. On Kangaroo Island where there has been a better retention of wetland habitat the butterfly is still stable, but localized in distribution.

**Threats**: On the mainland, this skipper has suffered considerably from the agricultural and urban disturbances of its saw-sedge wetland habitat. In historical times these wetlands were cleared, drained and burnt off, but the tenacious regrowth habit of the saw-sedges often won out. However, more aggressive farmers endured causing the wetlands to become severely fragmented. Due to the tall tussock growth habit of the saw-sedges it is usually cattle that are allowed to graze these wetlands, which they do very effectively when hungry, by eating and trampling the sedges back to near ground level. Remnant saw-sedge wetlands continue to be drained, putting terminal summer stress on the saw-sedges causing them to in-roll their leaves, which makes them unpalatable to the larvae of the skipper. Most saw-sedge bearing creeklines are now choked and smothered with weeds and introduced trees, particularly African feather-grass, ash, blackberry, broom, couch, ivy and kikuyu. Irresponsible disposal of urban and agricultural waste products and toxins inevitably end up in wetlands, the effects of which are ultimately going to have a detrimental effect on the wetland community, including this skipper, and it is apparent this skipper does not appear to be able to handle too much degradation of its habitat.

Colonies under environmental stress are quite possibly finished off by the parasitoid effects of the large orange-red, Ichneumonid wasps.

It is not known if this skipper is mutually compatible with *Hesperilla donnysa* in situations where they fly together, (due to male territorial battles). The latter is a very tough and adaptable skipper, tolerant of very degraded wetlands.

**Conservation Strategy**: The retention of pristine saw-sedge wetland habitat is essential for the survival of this skipper in South Australia, and specific habitat may have to be conserved for its long-term survival. There needs to be a major revegetation of suitable creeklines with the saw-sedge foodplants, and the latter should be included in all suitable revegetation projects. Remaining saw-sedge wetlands used for pastoral purposes need to be managed in an ecologically sustainable manner, and ideally, suitable wetlands need to be fenced off from the destructive feeding habits of grazing domestic stock. (Unfortunately, most wetlands on private land, usually dairy-land, are used as a backup food source for the cattle due to the adjacent pasture land having been severely overgrazed.) The control of mosquitoes in remaining broad-acre saw-sedge wetlands through the use of broad spectrum insecticides by aerial means needs to be judicially controlled, but preferably should cease, as it can be a major cause of fauna destruction. The draining of remaining pristine wetlands needs to cease, as this practice causes summer stress to the *Gahnia* that is ultimately fatal to *Hesperilla* larvae. The dumping of urban vegetation waste into creeklines and wetlands needs to cease. There needs to be a major public education process about the continuing degradation effects on wetlands.