

# Anti bacterial activity of Ferns - Christilla parasitica and Cyclosorus interruptus against Salmonella typhi.

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## ***Abstract:***

Aqueous and Acetone extracts of epidermal glands of the ferns, Christilla parasitica and Cyclosorus interruptus were tested both individually and in combinations against the growth of Salmonella typhi. Epidermal gland extracts of Christilla parasitica and Cyclosorus interruptus gave successful results in acetone base and poor results in aqueous base. The results were compared with that of the reference standard anti-biotic (Ciprofloxacin). It was found that extracts of Christilla parasitica gave 21 mm and Cyclosorus interruptus gave 22 mm in acetone extracts. Both gave resistant results in aqueous extracts. When Christilla parasitica and Cyclosorus interruptus were mixed, it gave only 18 mm zone.

## ***Introduction:***

For thousands of years, plants have provided humanity with many of the basic and important material required for day to day living including oxygen, food, clothing as well as being a source of compounds such as oils, resins, rubbers, gums, dyes, pesticides and drugs. India is one among the twelve mega diversity countries. The Pterido phytes are

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mostly distributed in the Himalayas. More than 300 species of ferns and fern allies are reported from the Western Ghats, South India (Manickam and Irudhayaraj 1992).

Gland is a special organ of plants, usually minute and globular which often secretes some kind of resinous, gummy or aromatic products. Gland extracts contain more chemical organs which is mostly useful for human beings.

*Christilla parasitica* (L) is the largest species complex in South India. Rhizome erect to long creeping, scales narrow with superficial hairs; fronds simple, pinnate, stipes adaxially grooved with the presence of copious hairs on the upper and lower surface of pinnate. Orange coloured elongated glandular hairs on the lower surface of costules and veins.

*Cyclosorus interruptus* is the rhizome; wide creeping, profusely branched 0-5 cm thick; scaly at the apex; scales 3 x 1.5 mm ovate, apex circuminate; margin entire, glabrous above and below. It is seen frequently as large colonies in open marshy places, lakes, walls and border of paddy fields. It is common on Annamalis and Kerala ghats; rare on Tirunelveli hills.

### ***Materials and Methods:***

The ferns *Christilla parasitica* selected for the present study were collected from the wild of different localities in the Western Ghats of South India. CP was collected

from Kothayar, Tirunelveli hills locality and at an altitude of 1200 meters. *Habitat*: Shaded or exposed road side (Voucher no: 23365). *Cyclosorus interruptus* (willd) was collected from Kothayar, Tirunelveli hills, 1400 meters, exposed marshy places. (Voucher no: 23364).

***Preparation of Plant extracts:***

The fronds of *Christilla parasitica* & *Cyclosorus interruptus* were separated and shade dried at room temperature (20 - 22° C) for a period of 2 weeks. The completely air dried fronds were dipped in acetone for two minutes to dissolve epidermal glands. This extract was concentrated by distillation and dried at room temperature. Initially 0.1% stock solution was prepared using acetone for further studies. From this dried extract 0.1% solution was prepared by diluting in acetone. The bacteria *Salmonella typhi* was procured from Scudder Microbiological Laboratory, Nagercoil, Tamilnadu. The Kirby Bans disc diffusion method (Ban et al 1960) was followed for anti bacterial study. Acetone was used as negative control and the antibiotic ciprofloxacin was used as positive control for *Salmonella typhi*. The ratio of gland extracts was:

- *Christilla parasitica* alone                      X
- *Cyclosorus interruptus* alone                      Y
- Both    (X + Y)

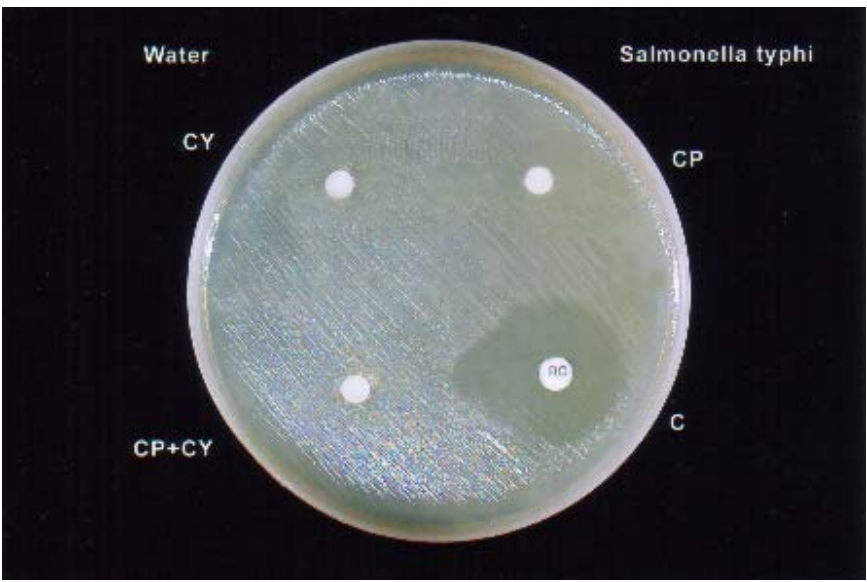
The zone of inhibition was measured after 24 hours of incubation.

### ***Results and Discussion:***

The epidermal glands are golden brown, elongated with short stalk in *Christella parasitica* and they are light greenish yellow, spherical and sessile in *Cyclosorus interruptus*. The results of present study show that the epidermal gland extracts of both *Christella Parasitica* and *Cyclosorus interruptus* (in acetone extract) shows remarkable effect on the bacteria *Salmonella typhi* when used individually. *Cyclosorus* gave maximum inhibition zone of 22 mm. *Christella parasitica* gave inhibition zone of 21 mm. When the extracts of epidermal glands of both the species were mixed, the inhibition zone was only 18 mm. Ciproflox, the positive control gave a maximum inhibition zone of 26 mm.

There is no effect with *Christella parasitica*, *Cyclosorus interruptus* and both in aqueous extract against *Salmonella typhi*.

<b><i>Organism</i></b> ( <i>Salmonella typhi</i> )	<b><i>Acetone</i></b>	<b><i>Water.</i></b>
<i>Christella parasitica</i>	21 mm	<b>R</b>
<i>Cyclosorus interruptus</i>	22 mm	<b>R</b>
<i>Christella parasitica</i> & <i>Cyclosorus interruptus</i>	18 mm	<b>R</b>
Positive control (Ciproflox)	26 mm	27 mm



***Conclusion:***

From the present study it is clear that the epidermal gland extracts of *Christilla parasitica* & *Cyclosorus interruptus* did not give any results in aqueous extracts when tested individually and in combination. But it gave remarkable results in Acetone extract. Epidermal gland extracts of *Cyclosorus interruptus* gave higher than the gland extracts of *Christilla parasitica* when the extracts were tested individually. In the mixture of extracts of epidermal glands of these two ferns gave poor results when compared to individual results.

***Acknowledgments:***

Authors are thankful to Dr. V. Irudayaraj, Lecturer, St. Xavier's College, Palayamkottai for his encouragements. They are also thankful to Mrs. Saroja Edwin and Mr. A. James Raja of Scudder Microbiology Laboratory, Nagercoil for their help in antimicrobial studies.

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