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## Study by Kerala scientists on spiders of Mangalavanam receives worldwide attention

*As spiders woo the scientists with their unique attributes, a Kerala team prepares to document its new findings before the world.*



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Silky Trap: *Nephila pilipes* is a potential silk-yielding spider

Even as hunted tigers and poached black bucks vie for space in India's collective conscience, an unassuming arachnid (an arthropod which has four pairs of legs and a body divided in two) is trying to crawl its way to the archlights.

Spider, the furtive side-stepper that induces undue fear among the weak-hearted, is emerging as a subject of extensive global research and an unlikely object of affection.

While the spider has not endeared itself in India to the extent that it is being adopted as a pet like in the West, the fervour for the furry arthropod is catching up.

The arachnology division of the Sacred Hearts College at Ernakulam in Kerala - the only one in south India - has conducted a pioneering study on the spiders of Mangalavanam, an evergreen mangrove forest on the sea coast in Kochi.

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## Study by Kerala scientists on spiders of Mangalavanam receives worldwide attention

The study has received worldwide attention, with scientists set to participate in the 22nd European Arachnology colloquium to be held in Sofia, Bulgaria, in August.



**Wide Spread:** *Chilobrachys hardwiki* was picked up by the arachnology division from Durgapur, West Bengal, after several reports of spider bites

"Our study has reported the existence of a respectable number of species, but the mangroves are facing ecological degradation which could endanger their survival," says M.J. Mathew, a member of the research team which conducted the study.

In fact, it was the Kerala High Court's instructions on preventing the forest's ecological degradation that spurred the study under P.A. Sebastian, head of the arachnology division.

According to the report, 51 species of spiders have been found, including three unknown ones, at the 2.5 hectare Mangalavanam forests lying between the backwaters and the Arabian sea, off Kochi.

The species belonging to 40 genera and 16 families represent 35 per cent of all spider families in India. They include seven feeding guilds, namely orb web builders, stalkers, ground runners, foliage runners and ambushers.

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So far, the division has identified more than 400 species of spiders in Kerala, including 35 new species, 47 first sightings in India and 55 endemic species. Recently, it also captured the rare Indian tarantula or tiger spider (*Pecilotheria regalia*)-so called for the yellow stripes on its eight legs-which fetches Rs 25,000 in the foreign market.

It is the first documentation of the spider's capture in the state since it was reported in the 1870s by British scientists. Four species of the tiger spider are found in Kerala's forests. "Spiders assume significance as the study of urban forests is a topic of extensive research and spider population is an indicator of the strength of the terrestrial ecosystem," says Professor John Joseph of the college.



**Finder's Pride:** *Malinella sebastiani*, a new species found by the arachnology division, has been named after team leader P.A. Sebastian



**Catch of the season:** *Araneus himalayensis*, which was found only in the Himalayas, has now been detected at the Mannavan Shola in Idukki

It is, however, spiders' own attributes that have sparked worldwide research in biotechnology.

The fibre used by some spiders in spinning their webs is stronger than steel, has stretchability which is comparable to rubber, high water absorption comparable to wool and is biodegradable.

In fact, research is being conducted in the US so that spider silk can be used to make parachute chords, tethers for aeroplanes and bullet-proof vests for the army.

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Research is also focusing on its use in medicine for making surgical sutures, artificial ligaments and tendons, even oxygenpermeable contact lenses.

"Spider silks are highly repetitive proteins produced by its glands. The fibre's physical properties are influenced by the amino acid sequence, spinning mechanism and environmental conditions," says researcher A.V. Sudhikumar. But a problem encountered in research, says Sebastian, is mass breeding.

### Worldwide Web

- A study by arachnology division at Ernakulam has found that:
- There are 51 species of spiders, including three new ones, at the Mangalavanam forests in Kochi.
- They belong to 40 genera and represent 35 per cent of all families in India.
- The division has found 400 species in Kerala, including 35 new ones.

The reason: spiders feed on each other. They are obligate carnivores (eating only living things) and are the only large class of arthropods which are predatory in nature.

"They don't just eat their own progeny, but some female species eat their smaller mates promptly after mating," says Sebastian after whom a new species, *Malinella sebastiani*, discovered by his team has been named.

To overcome the problem, experiments are under way on the application of molecular biology to synthesise spider silk after introducing the proteins in genetically engineered organisms like bacteria and yeast, plants like tobacco and potato, and even silkworm moth and goats.

In fact the arachnology division has sent a project to the Department of Biotechnology to conduct studies in the area.

Besides the research value, the fondness for spiders as pets in the West is at such a peak that many rare species are being smuggled out of Indian forests for the purpose. Little wonder then that the Kerala Forest Department is keeping a close watch on foreign tourists visiting the state's sanctuaries.

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"There is no effective law to check spider smuggling as it is not covered under the Wildlife Act. Many are smuggled in the name of research but end up in glass jars in drawing rooms in the West," says Sebastian.



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*Thelecantha brevispina* is extremely striking in appearance but is harmless



**Leggy Beauty:** *Cryptothelus sundaica* was found after 100 years from the Vagamon grasslands in Idukki

Debunking myths associated with spiders, Sebastian says that except for a few species like the Indian tarantula, which can cause itching and skin irritation, almost all Indian spiders are non-venomous.

"The only spider capable of causing death by biting is the Black Widow or *Latrodectus mactans* which is found in North America," he adds.

The variety of spiders is mind boggling, including wolf spiders which move like wolves, ant spiders which mimic ants and feed on them, and even *Portia*, named after the Shakespearean character, which invades other spiders' webs and eats them when they come to it thinking it is a prey.

It is, however, the spiders' silky attributes which are creeping into the scientists' imagination. It may be reason enough to ensure their survival.