



Spread, invasion and implications for management of *Mikania micrantha* and *Merremia boissiana* in the Hainan island

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Mikania micrantha has been spreading rapidly in Hainan since its first discovery in 2003. Frequent and various types of disturbances can break *Mikania* plants into small pieces and spread these fragments. Greenhouse experiments showed that single-node stolon fragments have a high regeneration capacity (67.5%). The regeneration rate and subsequent growth are positively associated with internode length, stolon thickness and the presence of leaves. The time needed for emergence averaged 8 days, ranging from 4-28 days. These results indicate that manual or mechanical control should not avoid the generation of small clonal fragments of *Mikania*, and repeated control with short time intervals (e.g. 1 month, when most of the fragments have regenerated but when the regenerated plants are small) is necessary in order to prevent reinvasion from the stolon fragments.

Merremia boissiana is an evergreen woody vine originating from South Asia that has caused significant harm

to many forests in recent decades in Hainan. *Merremia* typically invades disturbed forests, but has now expanded to natural forests in the Wuzhi Mountain, where there is tourism-associated disturbance. Surveys found that mature plants and emerged seedlings of *Merremia* were mainly distributed within 20 m from the tourist path, but a few reached more than 40 m into the forest interior. Larger seedlings were closer to the forest edge, compared with mature plants and emerged seedlings. A transplant experiment further indicated that emerged seedlings could not survive in the forest interior, but a proportion of them could survive on the forest edge. These findings suggest that while natural forests can probably resist seedling establishment of *Merremia* in the forest understory, *Merremia* seedlings may establish in disturbed sites near the tourist path and then expand to the forest interior through stolon elongation and climbing growth.

Characterization and phytochemical analysis of *Cyperus rotundus* and *Cyperus stoloniferus*

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The genus *Cyperus* belongs to the family Cyperaceae, which includes about 3000 species. Out of these about 220 species were identified as weeds. *Cyperus rotundus* is one among them. It is distributed throughout the world in both temperate and tropical regions. It grows naturally in paddy fields, farmlands, wastelands, sandy soil, damp and marshy places. There are number of compounds which have been extracted from plants for medicinal purposes. In recent years, *C. rotundus* has been given a special recognition in Ayurveda owing its therapeutic benefits to cure various diseases. The past studies has proved that this plant has many pharmacological activities such as anti-inflammatory, antibiotic, anti-diarrhoeal, anti-Candida, antimutagenic,

antimicrobial, antioxidant, cytotoxic and analgesic activities. This is a multipurpose plant, widely used around the world as medicine to treat stomach infections, wounds, boils and blisters and it contains alkaloids, flavonoids, tannins, starch, glycosides and sesquiterpenoids. In present study, essential oil was extracted from the tubers which contains Rotundene, D- Limonene, Myrtenol, Caryophyllene oxide, aromadendrene and many other compounds. *Cyperus stoloniferus* shows similar medicinal properties as *Cyperus rotundus*. Essential oil was extracted from the stolons of *Cyperus stoloniferus* also. It contains Patchoulene, Trans-Sesquisabinene hydrate, Longipinocarveol, Spathulenol and many other compounds.