



Australian Government
**Department of Agriculture,
Water and the Environment**



**Glenn Bellis¹, Arunrat Thepparat², April Wardhana³,
Li Le⁴, Yinglian Duan⁴ and Li Jiahui⁵**

¹Senior Entomologist, Department of Agriculture and Water Resources, Darwin, NT, Australia

²*Department of Agricultural Technology, Ramkhamhaeng University, Bangkok, Thailand*

³*Indonesian Research Centre for Veterinary Science, Bogor, Indonesia.*

⁴*Yunnan Animal Science and Veterinary Institute, Kunming, Yunnan, People's Republic of China.*

⁵*College of Environment and Plant Protection, Hainan University, Haikou, Hainan, People's Republic of China.*

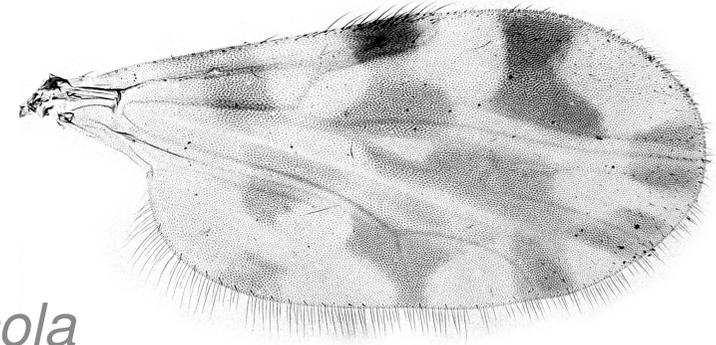
Potential Vectors of African Horse Sickness in Asia

An overview of *Culicoides* biology, ecology and vector status



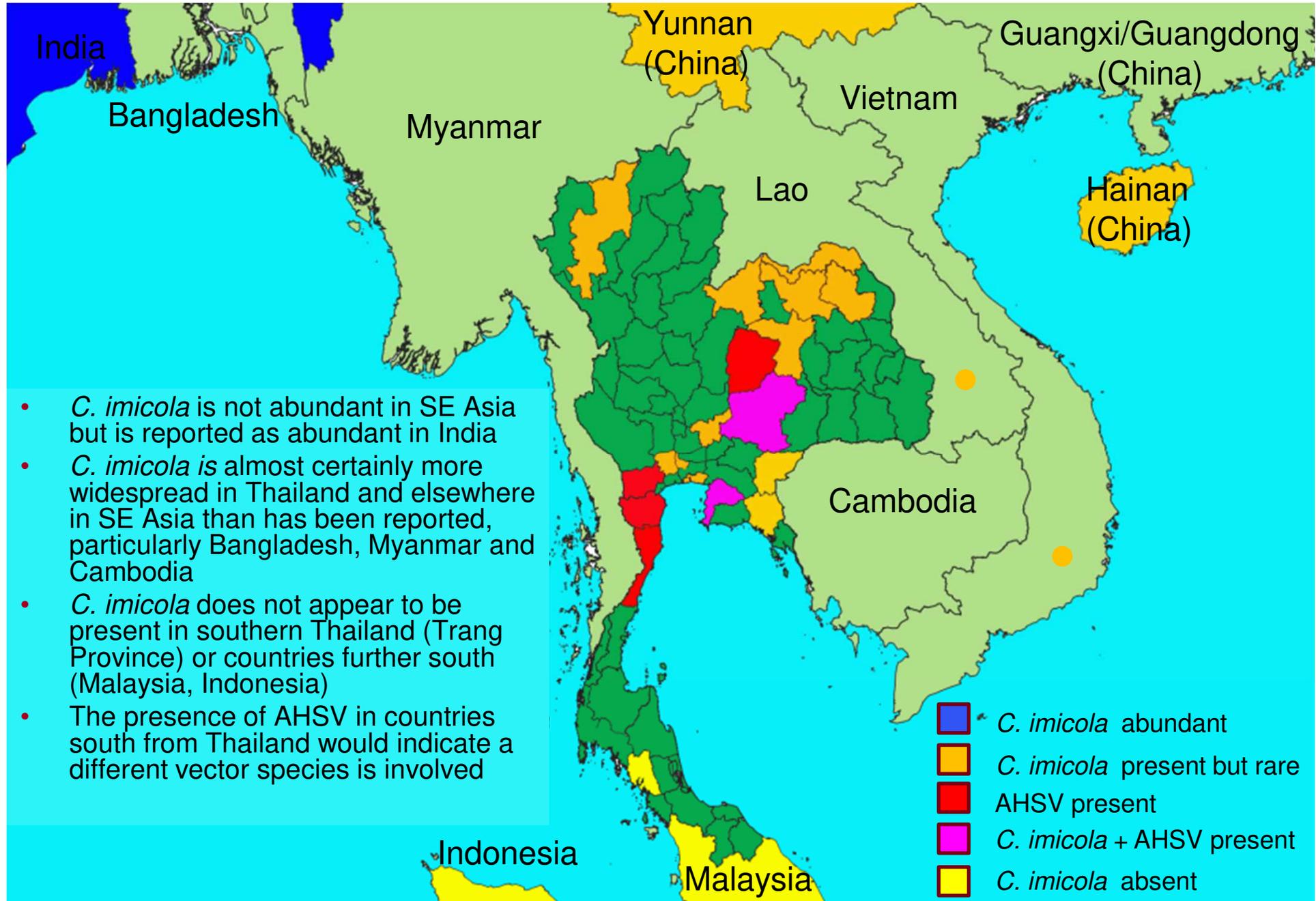
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Vectors of AHSV in endemic areas



- 1 proven vector species, *Culicoides imicola*
- 13 other species associated with AHSV
- While association with AHSV is not restricted to closely related species, the most important vectors are closely related
- The majority of South African species tested were capable of becoming infected with AHSV
- Any species associated with horses should be regarded as a potential vector
- Some correlation between vectors of AHSV and BTV

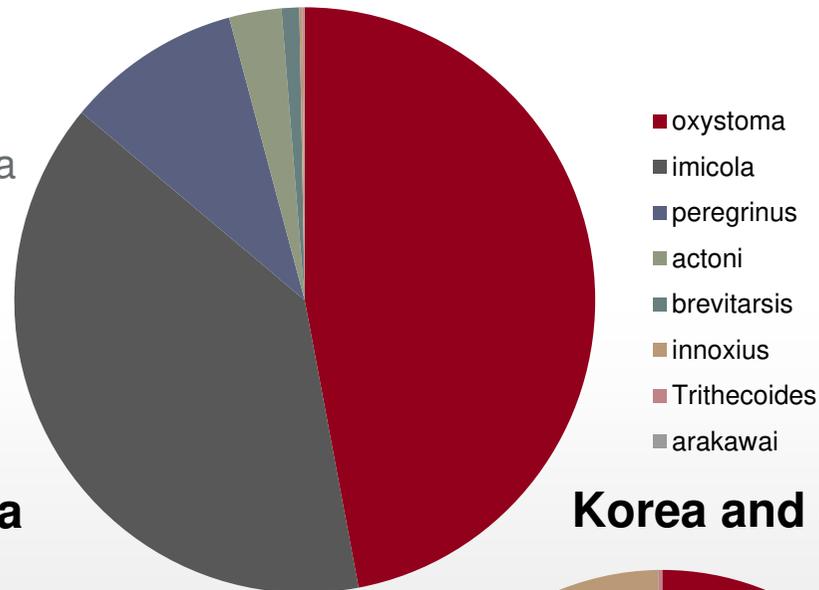
Distribution of *C. imicola* and AHSV in Southeast Asia



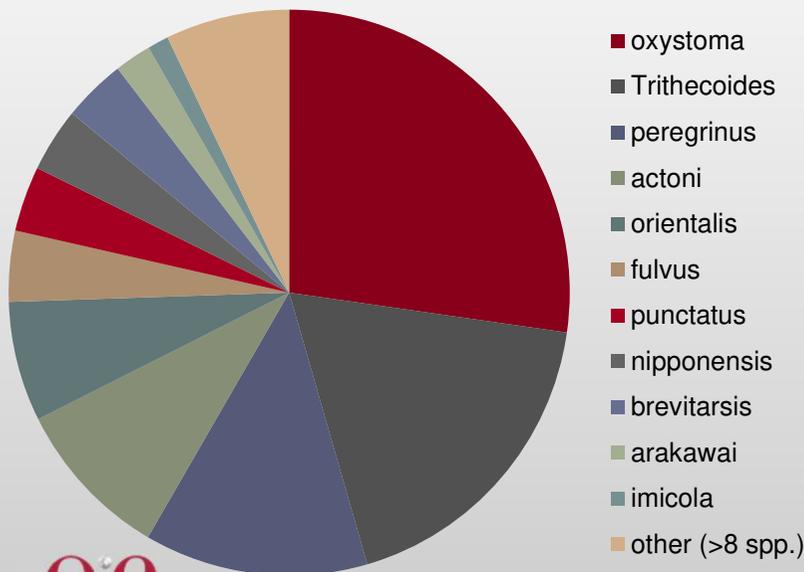
Most abundant species on Asian cattle farms

- Almost no information on *Culicoides* associated with horses in Asia
- *C. oxystoma* is the most abundant species associated with cattle in Asia
- The abundance of other species varies with location
- Greater diversity of species in southeast Asia

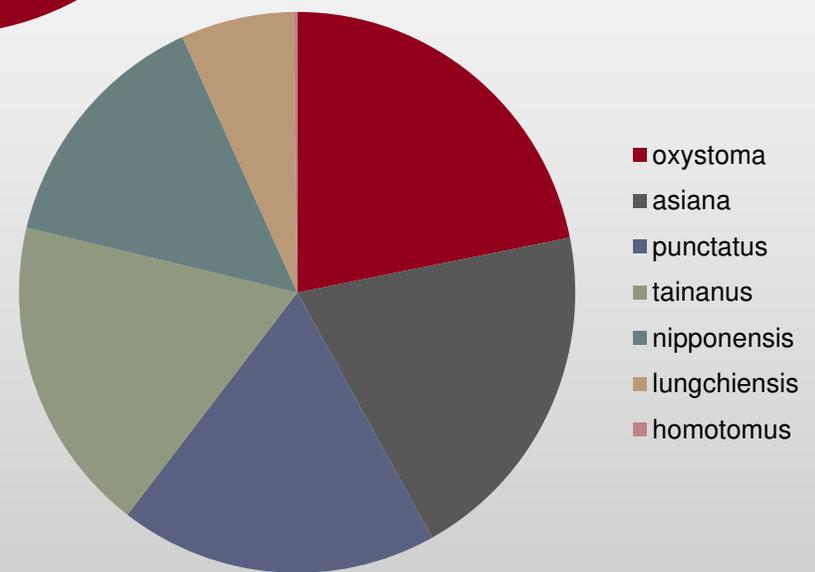
India



SE Asia + southern China



Korea and Japan



Most likely vector species in Asia

The low populations of *C. imicola* in SE Asia suggest that it is not solely responsible for the transmission of AHSV. Other species likely to be involved are ranked based on relative abundance on cattle farms in Asia, relationship to known vector species in Africa and association with other arboviruses of large mammals.

Southern Asia:

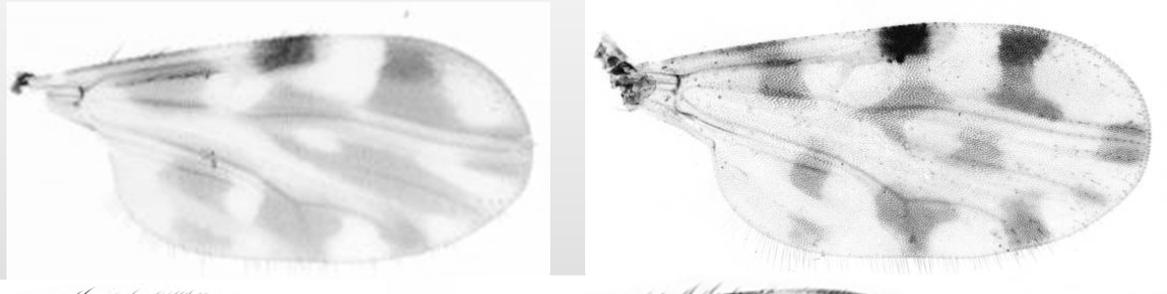
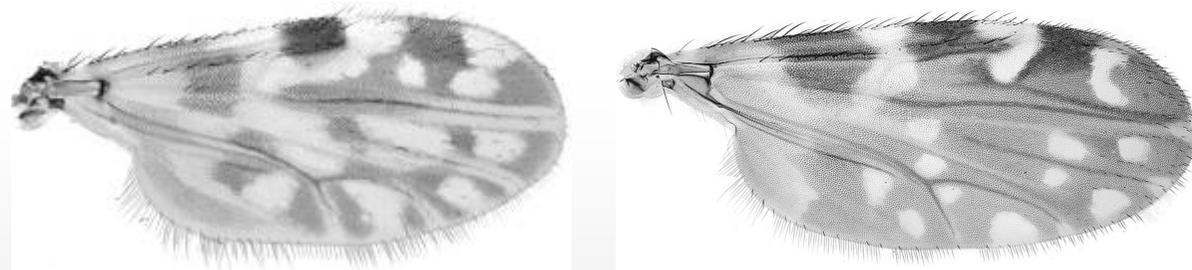
C. oxystoma

C. peregrinus

C. actoni

C. Subgenus *Trithecoides* can be very abundant but they are difficult to identify to species so little data is available

C. nudipalpis



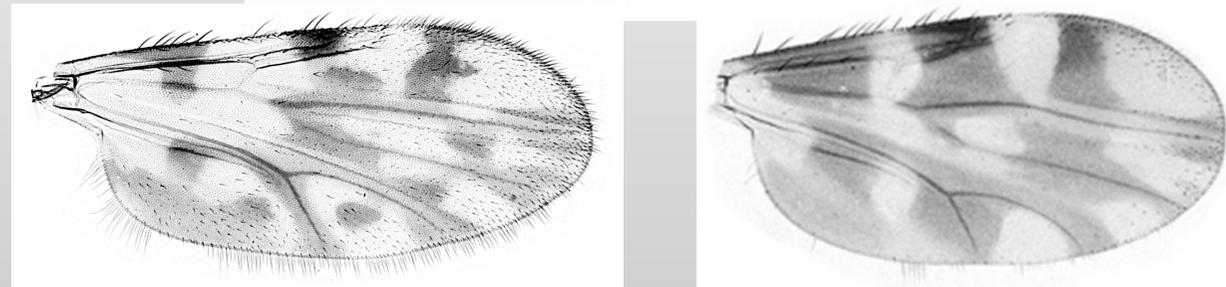
Northern Asia:

C. oxystoma

C. asiana

C. punctatus

C. tainanus



Countries most at risk of AHSV incursion

- Countries containing high populations of *C. imicola* are at higher risk of an incursion of AHSV.
- India, with its high populations of this species, would seem at most risk although the lack of information about the status of Bangladesh and Myanmar hampers assessment of these countries.
- Southern Myanmar in particular is geographically close to the outbreak in Thailand.
- An incursion into Trang Province in Thailand or in Malaysia, which are both thought to be free from *C. imicola*, would require a different species of vector.
- The ultimate distribution of AHSV in Asia will depend on which local species prove to be competent vectors

Barriers to understanding the potential distribution of AHSV in Asia

- Information on the species of *Culicoides* present in Myanmar, Cambodia and Bangladesh is needed to assess the risk posed to those countries.
- Information on *Culicoides* species that attack horses in Asia is almost totally absent
- Relative abundance data of *Culicoides* around livestock is absent for most of SE Asia.
- The ability of Asian species of *Culicoides* to transmit any arboviruses is lacking for most Asian countries
- Local capacity to identify or undertake research on *Culicoides* is restricted to very few individuals and is totally lacking in many countries
- Taxonomic status of many Asian species is confused leading to incorrect identifications in many published reports
- The development of DNA barcode libraries for Asian species may assist with identifications



Glenn Bellis
Glenn.Bellis@outlook.com
Glenn.bellis@awe.gov.au



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12, rue de Prony, 75017 Paris, France
www.oie.int
media@oie.int - oie@oie.int

