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THE RED PALM WEEVIL, *RHYNCHOPHORUS FERRUGINEUS* (COLEOPTERA: CURCULIONIDAE), NEWLY REPORTED FROM ZHEJIANG, CHINA AND UPDATE OF GEOGRAPHICAL DISTRIBUTION

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The red palm weevil (RPW), *Rhynchophorus ferrugineus* (Oliver) (Coleoptera: Curculionidae) is native to southern Asia and Melanesia where it is a serious pest of coconuts (Malumphy & Moran 2007). It has been a devastating insect pest to palms with a wide geographical distribution in Europe-Asia (Wattanapongsiri 1966; Zhang et al. 2003; Al-Ayedh, 2008).

According to EPPO (2005, 2008), the weevil has become naturalized in isolated areas in every country of southeastern, southern and western Asia. In East Asia, RPW was recorded from Japan in 1975 in horticultural palms (Matsuura 1993). In the Mediterranean sea rim, Egypt first recorded the weevil's distribution in 1992 from Ismaelyia and Sharkyia governorates. Spain reported its presence in 1996 from Andalucía and continuously from Comunidad Valenciana since 2004. RPW was reported from the Canary Islands (Murcia, Islas Baleares, and Islas Canarias) since 2007; from Jordan and Israel since 1999 (under eradication); from Italy since 2004 (Campania, Lazio, Puglia, Sardegna, Sicilia, Toscana), from Turkey since 2005 (Mersin province), from Cyprus since 2006, from France since 2006 (Corse, Provence-Alpes-Côte d'Azur), and from Greece since 2006 (Kriti, Rhodos). In Oceania, RPW was recorded from Australia (isolated record in Queensland), Papua New Guinea, Solomon Islands, Western Samoa, and New Caledonia (Wattanapongsiri 1966).

Because the geographical area of each province in mainland China is large, knowledge of the distribution of alien insect species distribution is important for quarantine purposes. Herein we report new records of RPW in Zhejiang province and update the geographical distribution in China.

In Oct, 2007, RPW adults were found and identified from live and dead trees of the Canary Island date palm (*Phoenix canariensis* Hort. ex Chabaud) in the urban Liandou district (28°27'31"N, 119°54'49"E), Qingtian (28°08'56" N, 120°16'59"E), and Junyun (28°38'56"N, 120°03'01"E) counties of Lishui city, located in the central part of Zhejiang province in the east coast of China. The specimens were identified according to the taxonomic key of Wattanapongsiri (1966) and Zhang et al. (2003). RPW infested 13% of the trees (n = 61) in the urban Liandou district. In Dec 2007, RPW was further collected and confirmed from Cangnan county (27°20'32"N, 120°23'52"E) of Wenzhou city, the most southeastern coast of the Zhejiang Province. These events are the first reports of RPW in Zhejiang province. All the trees infested with the weevil were dug out and burned, and all the remained palms nearby the infested trees were treated with 3% phoxim, granule insecticide, 250-300 g per tree by deep-soil application surrounding the trees, or 50-fold dilution of 35% acephate EC or 80% DDVP as a drip from a syringe into the tree xylem.

It is assumed that the invasion of the weevil into Lishui city, Zhejiang, occurred because of illegal importation of the Canary Island date palm trees without quarantine inspection from Zhangzhou (24°31'N, 117°39'E) in the Fujian province, where the weevil was found in 2003 (sr.yuanlin.com/Html/SrNews/Detail/2008-9/8519.html).

In China, RPW has been known from Hainan since 2000 (Qin et al. 2002), from Guangxi and Guangdong in Zhongshan since 1997 (Li et al. 2000) and from Guangzhou since 1999, when intercepted in Nanhai Port of Guangzhou City, (Huang et al. 2000), Taiwan, Yunnan (Liu et al. 2002), Tibet (isolated in Mutuo county), Fujian in Xiamen since 1990s, Zhangzhou county since 2003, and Shanghai city, Songjiang district since 2003 (Ju et al. 2006).

In the Songjiang district (30°59'N, 121°10'E) of Shanghai Municipal City in 2003, many ornamental palm trees were found dead and RPW was identified as causative agent (Ju et al. 2006), but the weevil was only intercepted from imported cargo 2 years later in Aug, 2005, suggesting that colonizers arrived through inter-provincial approaches inland.

These newly discovered cases of RPW from the Zhejiang Province indicate that the weevil has been rapidly expanding to 9 provinces in southern China. With the increased movement of ornamental Palms among southern provinces, the other southern provinces such as Sichuan, Chongqing,

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Guizhou, Hunan, Jiangxi, Anhui, and Jiangsu, which are surrounded by the infested provinces, are all vulnerable to being invaded by RPW. Pest risk analysis on *R. ferrugineus* has indicated that the weevil could establish itself in all 16 southern provinces of China (Ju et al. 2008). Therefore, quarantine measures should be initiated for the inter-district, inter-provincial transportation of ornamental plants.

Summary

The red palm weevil (RPW) *Rhynchophorus ferrugineus* was newly recorded in 2007 from eastern China's Zhejiang Province and all coastal provinces of China from Shanghai southward have reports of isolated distributions of RPW. The total number of provinces with the weevil increased to 9 and the other inland provinces are under threat of invasion. The project was funded by the National Basic Research and Development Program of China (973 Program Grant No. 2009CB119200).

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