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NEWS

China launches the “IAS1000 Project”

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1. IAS1000 Project

The rapid development of omics provides new technologies and methodologies for the study of invasion biology. Agricultural Genomics Institute at Shenzhen (CAAS-AGIS) and Institute of Plant Protection, Chinese Academy of Agricultural Sciences (CAAS-IPP) initiated the “IAS1000 Project” — A genome project of 1000 invasive alien species, and established the “IAS1000 Alliance” in Shenzhen, China, on November 14, 2018. *Via* deep-mining of omics data, the project aims for better understanding the ecological processes and molecular mechanisms of biological invasion, and developing new technologies and products for prevention and management of invasive alien species. Up to now, there have been more than 40 research institutes, universities and enterprises participating in this project, forming an omics team with multi-disciplinary members.

The main tasks of “IAS1000 Project” include: (i) building a global collaboration platform for an in-depth research on molecular mechanisms of invasiveness; (ii) developing new technologies and products for prevention and control of invasive alien species, including RNA interference, gene editing, molecular pesticides with specific target carried by

new physical/chemical materials, intelligent recognition of molecular odor, utilization of molecule-induced immunity, creation of new vaccines, and the restorer of soil ecological network; (iii) cultivating new elite talents in the integrated subjects encompassing omics, invasion biology, entomology and botany, etc.

2. First list of species for genome sequencing in the framework of IAS1000

The “IAS1000 Aalliance” published the first list, including 25 genomes of important invasive species ranging from invasive animals and weeds, agricultural pests to resource animals. The list includes 11 insect species, seven plant species, two mollusk species, two agricultural pests, two annelid worm species, and one species of nematode (Table 1). For some species, genome sequencing will be completed in a short time.

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Table 1 First list of important species in agriculture for genome sequencing

Order	Family	Scientific name	Common name
Asterales	Asteraceae	<i>Mikania micrantha</i> H. B. K.	South American climber, Mile-a-minute weed
	Asteraceae	<i>Ageratina adenophora</i> (Sprengel) King et Robinson	Crofton weed
	Asteraceae	<i>Sphagneticola trilobata</i> (L.) Pruski Syn. <i>Wedelia trilobata</i> (L.) Hitchc.	Trailing daisy
	Asteraceae	<i>Ambrosia trifida</i> L.	Giant ragweed
	Asteraceae	<i>Solidago canadensis</i> L.	Canada goldenrod
	Asteraceae	<i>Xanthium italicum</i> Moretti	Italian cocklebur, Common cocklebur
Caryophyllales	Amaranthaceae	<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	Alligator weed
Lepidoptera	Tortricidae	<i>Cydia pomonella</i> (L.)	Codling moth
	Gelechiidae	<i>Tuta</i> sp.	Potato tuberworm
	Gelechiidae	<i>Phthorimaea operculella</i> (Zeller)	Potato tuberworm
	Noctuidae	<i>Spodoptera exigua</i> (Hübner)	Beet armyworm, Small mottled willow moth
Hemiptera	Aphididae	<i>Eriosoma lanigerum</i> (Hausm.)	Woolly apple aphid, Woolly aphid, American blight
	Pseudococcidae	<i>Phenacoccus solenopsis</i> Tinsley	Solenopsis mealybug
Coleoptera	Curculionidae	<i>Lissorhoptrus oryzophilus</i> Kuschel	Red palm weevil, Asian palm weevil, Sago palm weevil
	Curculionidae	<i>Rhynchophorus ferrugineus</i> (Olivier)	Red palm weevil, Asian palm weevil, Sago palm weevil
	Hispididae	<i>Brontispa longissima</i> (Gestro)	Coconut leaf beetle
	Hispididae	<i>Octodonta nipae</i> (Maulik)	Coconut leaf beetle
	Scarabaeidae	<i>Postosia brevitarsis</i> Lewis ¹⁾	Coconut leaf beetle
	Diptera	Agromyzidae	<i>Liriomyza sativae</i> Blanchard
	Agromyzidae	<i>Liriomyza huidobrensis</i> (Blanchard)	Pea leaf miner
Architaenioglossa	Ampullariidae	<i>Pomacea canaliculata</i> (Lamarck) ¹⁾	Golden apple snail, Channeled apple snail
Stylommatophora	Achatinidae	<i>Lissachatina fulica</i> (Bowdich) Syn. <i>Achatina fulica</i> (Ferussac)	Giant African snail, Giant African land snail
	Lumbricidae	<i>Eisenia fetida</i> (Savigny) ¹⁾	Redworm, Brandling worm, Trout worm, Tiger worm
Haplotaxida	Megascolecidae	<i>Perionyx excavatus</i> (Perrier)	Indian blue worm
Tylenchida	Heteroderidae	<i>Heterodera glycines</i> Ichinohe ¹⁾	Soybean cyst nematode

¹⁾ The four populations were different from previously sequenced populations and these populations will be re-sequenced in "IAS1000 Project".