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Aliens of Xamayca

a newsletter on non-indigenous species in Jamaica

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ASIAN TIGER SHRIMP

The Asian tiger shrimp or giant tiger prawn (*Penaeus monodon*) is native to the Indo-west Pacific, namely East Africa, South East Africa, Pakistan to Japan, Malay Archipelago and northern Australia[2]. The tiger shrimp is rusty brown in colour with a distinctive black and white band across the back and on the tail[3].

Other colour variations may be seen, which are dependent on the substrate, food eaten, and water turbidity of the area in which the tiger shrimp is found; for example green, brown, red, grey, blue and transverse band colours on the abdomen and shell that are alternated between blue or black and yellow[1]. The size of the tiger shrimp ranges from 30 to 33.6cm in length, with females being generally larger than males[1,2].

Asian tiger shrimp (© Dr. Karl Aiken)

The Asian tiger shrimp can be found in water depths of 0 to 110m and in mud, sandy or muddy-sandy bottoms in estuarine and marine habitats[1,2]. They are reported to mature and breed in tropical marine habitats whereas larvae, juveniles, and young adults tend to occupy shallow coastal estuaries, lagoons, and mangrove areas[3]. During moulting, the outer shell of the tiger shrimp is soft, which makes them vulnerable to predators[1].

Mating occurs shortly after moulting and at night. Asian tiger shrimp females can produce as many as 500,000 to 750,000 eggs. In some cases, up to 1 million eggs have been reported[4]. Spawning occurs at nights, with hatching occurring up to 12-24 hours after fertilization[1,4].

The survival and dispersal of the Asian tiger shrimp in new environments is temperature dependent, preferring optimal temperatures of 28°C to 33°C for growth and survival[3]. The success of the species is also attributed to their broad salinity tolerance (2-30‰), especially in aquaculture[1].

In the Caribbean and other parts of the world, the Asian tiger shrimp has been mainly introduced for aquaculture. Other reported sources of introduction include ballast water and natural disasters (e.g. hurricanes)[3]. The tiger shrimp is also used as bait[2].

The impact of the tiger shrimp is varied. They can negatively impact native shrimp species by outcompeting them for food. Tiger shrimps are known to eat crabs, oysters, and smaller shrimps. In addition, tiger shrimps have a high growth rate and comparable spawning rates compared to native shrimp species[4]. They also has the potential to transmit viral diseases to native shrimp species and other crustaceans[3].

In Jamaica, the Asian tiger shrimp has been found in Great Salt Pond, St. Catherine and reports have been received of fishermen collecting the species as far back as October 2011. Persons who see the Asian tiger shrimp in Jamaica's waters are asked to make a report to the National Environment and Planning Agency (NEPA) @ 754-7540 or by email to pubed@nepa.gov.jm.

Contributor: Shakira Azan, NEPA

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WATER LILIES

Water lilies refer to a group of flowering aquatic plants belonging to the family Nymphaeaceae. Fragrant and beautiful, these plants are often used as ornamentals in water gardens, ponds and fountains in several hotels and homes across the world. Despite its beauty, this aquatic plant is also an invasive species. Like its counterpart the water hyacinth, the rapid establishment of this plant in warm temperatures can often result in the shading out of sunlight and depletion of oxygen for other plant species. They can also raise the temperatures in bodies of water.

There are over 70 species of water lilies worldwide, several of which are found in Jamaica and the wider Caribbean. Water lilies are true aquatic plants, anchoring their roots within the soil while resting their large, waxy coated broad leaves over the water's surface. The size, shape, colour, patterns, number of petals, flowers, stamen and leaves vary greatly; however, they can be broadly classified into 2 groups: Hardy and Tropical types.

Hardy water lily (left) and Tropical water lily (right) (@http://www.extension.iastate.edu/newsrel/reiman/WaterLilyPad.jpg; http://blog.alpinegrows.com/?tag=tropical-water-lily)

While the Hardy type is the most common, the Tropical type is the more favoured, with larger blooms, the ability of some of its varieties to bloom at night, and the additional colour hues of blue (only the Hardy type has pink and white hues). Apart from its beauty and fragrance, water lilies also provide an excellent habitat for several creatures. It provides shade for several types of fish and frogs from overhead predators, and food to animals such as deer, beavers, and birds.

In Jamaica, water lilies are quite popular amongst hotels with water gardens and ponds, but can also be found lining several rivers and covering ponds throughout several parishes including St Elizabeth and Westmoreland. The lilies are especially abundant during spring and summer months, when the warmer temperatures are recorded and in slow moving to almost stagnant water.

Water lilies on the Black River, St. Elizabeth (@Marsha Mason)

Water lilies reproduce through the use of seeds and rhizomes. Mature water lilies can release up to 2,000 seeds per fruit. The seeds are coated by a thin membrane, which protects them as they travel down streams or in birds that eat the fruit and distribute the seeds elsewhere. Once the seeds are established in soil, 0.4 to 5m below the water's surface, they germinate, sprouting flexible stems that produce flat, waxy, water-repellant leaves.

Below the leaf bases, horizontal creeping rhizomes are formed, each capable of sending up its own flexible stem and leaves. The stems themselves are hollow, allowing for gaseous exchange between the surface and the rhizomes beneath the water's surface. With an approximate growth rate of one rhizome covering about 4.6m in diameter in 5 years, small patches of water lilies can quickly become dense stands.

Shallow lakes are especially vulnerable to the proliferation of the water lilies. Shallow waters are warmer due to the sun not having to penetrate far to get to the lake floor. As the lilies increase their coverage, more sun is absorbed through their leaves, and transferred to the water. As the temperature rises in the lake, so does the growth rate of the lilies. In a survey conducted in 1994 of lakes in Washington, all lakes showed the presence of the water lily. One particular lake, the Giffin Lake, went from approximately 25% (1974) to 100% coverage (1994) of water lilies in this 110 acre lake. The lilies restricted lake access, disrupted swimming and recreational sports, and affected much of the wildlife under the lake's surface.

Apart from disruptions to human activities, the danger to local wildlife, flora and fauna, resulted in numerous requests for the use of pesticides to remove this menace, even though these water lilies were intentionally introduced to many lakes by property owners who enjoyed their beauty. Several methods have since been employed to remove this troublesome plant.

Chemical control involved the use of glyphosate, a herbicide that could be applied directly onto the surface of the plants. The only challenge experienced was the removal of the 'dead-floating mats'. Other methods employed were cultural, such as removing any new and emerging leaves, but these took much longer periods to clear. Mechanical methods, such as the cutting and harvesting of the plants, were a good way of thinning out plant densities, but had to be repeated often due to its rapid growth rate. The active removal of the rhizomes has also been done. Because of the growth extent of water lilies, bio-control methods were not employed, especially if an owner wanted to maintain plants in a garden setting.

Northern Jacana walking on lily pads (left) and a pond with water lilies in Harris Savanna, Clarendon (right) (@Marsha Mason and Shakira Azan)

For now, water lilies are not considered major invasive species like other aquatic plants such as the Water Hyacinth, but the potential for major outbreaks in rivers and ponds remains at the fore front of concern.

Contributor: Dr. Peta-Gaye Chang, Ministry of Agriculture & Fisheries

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CALABASH

Calabash (*Crescentia cujete*) is a member of the Bignoniaceae or trumpet flower family, which contains 120 genera with about 800 species (trees, shrubs and rarely herbs) that are found mostly in tropical America. Some species are also found in the subtropics and tropics of the Old World.

Native to Central America, the Calabash Tree is also found in the Caribbean, Brazil, Peru, southern Florida, California, and Bermuda. The Calabash Tree is commonly known as 'Packy' and is the national tree of St. Lucia. In Jamaica, Calabash trees grow from sea level to approximately 420m and are found along roadsides, and in gardens, old pastures, thickets and woodland margins.

Calabash trees can attain heights of 6-10m. The trunk is crooked and long with relatively slender branches that form an open crown. The bark is pale-brown and flakes off in long irregular patches. The leaves are slightly leathery, 20cm long and 6cm wide, and grow mostly in clusters of 3's to 5's on spurs along the branches. Flowering and fruiting occurs from May to January.

One of two Calabash trees located on the University of the West Indies, Mona Campus (©Shakira Azan)

The Calabash's large, waxy, bell-shaped flowers are 6.35cm long and 4.45cm wide, borne on the trunk and the older branches of the tree and are characterized by a strong odour. Their colour varies from greenish-white to greenish-yellow with purple streaks and touches of red or yellow. The large, rounded, woody gourd-like fruits, which develop from the flowers, are about 25cm in diameter. Immature fruits are glossy green and turn brown as they ripen and become dry.

Flower (after blooming) and immature fruits on a Calabash Tree (©Shakira Azan)

The Calabash tree and fruit have many uses. The tree is used for shade and as an ornamental in gardens. Throughout Jamaican history, the wood of the tree has been used to make coaches, saddles, mule and donkey crooks, stools, cattle yokes, chairs, shafts or handles for carpenters' tools, ribs in boat building, wooden wheels, and as a base to grow orchids.

The fruit has been used as animal fodder, and to make cricket balls. Anecdotal reports noted that the pulp of the fruit has been eaten by cooking it as a vegetable or used to make pickle by dicing the fruit and adding salt, vinegar, pepper and pimento seeds.

The fruit has also been used for medicinal purposes, for example, to treat ailments of coughs and colds, 'worms', 'bruised-blood' and back pain. Preparation of this medicine included roasting the calabash and adding other ingredients such as sweetsop leaves, chigger nut leaves, wine, overproof rum, salt, sugar, or castor oil. The seeds have been used to make a cool beverage.

The shell of the fruit has been used as a pot to boil water or cook in, transport provisions, hold water or rum, and to make utensils (e.g. cups, saucers, bowls, ladles, spoons) and curios. Musical instruments such as rattles (maracas or shaker), flutes, a rustic banjo or guitar called a *merry wang*, scrapers, and *jenkoving* have also been made from the shell. The *jenkoving* is made from an empty bottle or calabash and is played by slapping the hands over the open mouth of the calabash/bottle.

Other reported uses of the calabash include: bailer of water, container for bait, sinkers, and fish hooks, oil skimming vessel, fibre, jewellery (e.g. bracelets, necklaces, earrings and pendants), plant hangars, baskets, hampers, decorative wall ornaments, light shades, saving boxes, decanters, handbags, teapots and dishes.

Uses of the Calabash - gig and rattle combination (top left), bowls (top right), and handbags (bottom left and right) (©Shakira Azan)

Like the Silk Cotton Tree, the Calabash has been linked to the spiritual realm. Trees were often planted in graveyards to act as grave markers. In addition, the trees were suggested to mark the location of spirits as well as to shelter them. In case of the latter, libation is offered to the spirits by sprinkling rum under the tree and on the calabash itself – in essence, the dead are remembered and protected by the tree planted at the graveside. Birds that used the Calabash tree for roosting were often termed 'duppy birds' and shooting of these birds was reported to result in disastrous consequences.

Contributor: Shakira Azan, NEPA

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LOGIC PUZZLE GAME–PET MIX UP

Background

At the pet store, 3 children chose to buy a pet. When they were finished selecting their pets, the attendant said that the pets would be delivered to their homes the next day. Minutes after the children left the pet store, a macaw escaped from its cage and flew around the pet store. While trying to catch the macaw, the attendant overturned his desk. The delivery sheet with the information of which pet should go to which child slipped under the snake cage. After caging the macaw, the attendant realized that the delivery sheet was missing.

Using the facts provided below, identify the pet that was ordered by each child. Did someone buy an invasive alien species?????

1. The boy that ordered the Red-eared Slider Turtle (*Trachemys scripta elegans*) did not name it "Sparky".
2. Matthew's pet, who he called "Iggy", is not the animal that flies.
3. "Snappy", who is not a Green Iguana (*Iguana iguana*) was bought by Simon.
4. The Ring-necked Parakeet (*Psittacula krameri*) was not bought by Matthew.
5. "Sparky" was ordered by Mary.

		PET'S NAME			PET		
		Snappy	Iggy	Sparky	Red-eared Slider Turtle	Green Iguana	Ring-necked Parakeet
NAME	Mary						
	Matthew						
	Simon						
PET	Red-eared Slider Turtle						
	Green Iguana						
	Ring-necked Parakeet						

Choose a (√) for TRUE and an (X) for FALSE in the box squares to correctly match the pets bought with the names of their owners.

HOW MANY WORDS CAN YOU MAKE?

C	U	A
R	A	I
A	N	S

Make words containing 3 or more letters.

The letter in the shaded box MUST be used at all times and you have to unscramble the 9-letter word to be considered **excellent**.

If you make 10 words, you are **okay**. If you make 20 words, you are **good** and if you make 30 words or more, you are **very good**.