

Procambarus clarkii



Taxon	Family / Order / Class / Phylum
<i>Procambarus clarkii</i> (Girard, 1852)	Cambaridae / Decapoda / Crustacea / Arthropoda

COMMON NAMES (English only)

Red swamp crayfish/crawfish
Louisiana crayfish/crawfish

SYNONYMS

Cambarus clarkii Girard, 1852

SHORT DESCRIPTION

Crayfish with total body length (TL) up to 15 cm. Adults are usually dark red, orange, or reddish brown. Chelae are red on both surfaces, typically S-shaped and covered in spines and tubercles. Females have the seminal receptacle located between bases of posterior walking legs. Sexually active males have distinct grasping hooks on the ischia of the 2nd and 3rd pairs of walking legs that are used to hold females during copulation. Adult individuals mainly feed on plants and detritus, while juveniles consume a higher proportion of animal food. Sometimes cannibalistic.



Close-up of *Procambarus clarkii*

Photo: Riccardo Innocenti, University of Florence

BIOLOGY/ECOLOGY

Dispersal mechanisms

Long-distance dispersal is facilitated by intentional introduction. On the local scale it can migrate long distances on land, even exceeding 3 km per day.

Reproduction

Has a short life cycle and a high fecundity. The reproductive cycle is extremely plastic. Two generations per year are possible at low latitudes.

Known predators/herbivores

Large birds (e.g. cormorants, crows, herons, and storks), predaceous fish (e.g. eels, perch), and some carnivorous mammals (e.g. otter). Large invertebrate predators (e.g. dytiscid beetles) may consume juveniles.

Resistant stages (seeds, spores etc.)

Unknown.

HABITAT

Native (EUNIS code)

C2: Surface running waters, C3: Littoral zone of inland surface waterbodies.

It is able to occupy a wide variety of habitats, particularly wet habitats.

Habitat occupied in invaded range (EUNIS code)

C2: Surface running waters, C3: Littoral zone of inland surface waterbodies. It is found in natural and agricultural areas throughout south central Europe. Prefers small but permanent waterbodies.

Habitat requirements

The species is tolerant of a wide range of environmental conditions, including saline waters. It is able to tolerate dry periods of up to four months.

DISTRIBUTION

Native Range

It is native to north-eastern Mexico and south-central USA, extending westward to Texas, eastward to Alabama, and northward to Tennessee and Illinois.

Known Introduced Range

Several states of USA outside its native range, parts of Central and South America, eastern Asia, parts of eastern and southern Africa, southern, central and western Europe.




Trend

It was legally introduced into southern Spain in 1973 from Louisiana (USA) and later illegally introduced throughout Spain, France, Italy, and other countries in 1970-1990. A hypothesized extra-European source area of introduction is East Africa. It is increasing in many areas.

MAP (European distribution)



Legend

	Known in country		Known in CGRS square		Known in sea
---	------------------	---	----------------------	--	--------------

INTRODUCTION PATHWAY

Besides intentional introductions mainly for aquaculture, it can spread to new areas by anglers for local consumption but also because it is used as bait.

IMPACT

Ecosystem Impact

It has contributed to the decline of the native European crayfish (family Astacidae) because it outcompetes them and acts as a vector for the transmission of the crayfish fungus plague, *Aphanomyces astaci*. It also reduces the value of invaded freshwater habitats by consuming invertebrates and macrophytes, and by degrading riverbanks because of its burrowing activity.

Health and Social Impact

It accumulates heavy metals and toxins produced by Cyanobacteria, such as *Microcystis aeruginosa*, and can transfer them to its consumers, including humans. It is an intermediate host of trematodes of the genus *Paragonimus*, which are potential pathogens of humans if undercooked crayfish are consumed.

Economic Impact

If present in irrigation structures, such as reservoirs, channels or rice fields, may cause significant economic losses. This is due to both its burrowing activity, which alters soil hydrology and causes water leakage, and its feeding habit, which causes damage to rice plants.

MANAGEMENT

Prevention

The import of live crayfish from abroad is banned by customs legislation in some European countries.

Translocation to areas not yet invaded is banned in U.K. The public should be educated in the environmental risks posed by the species and in the use of simple measures to prevent the diffusion of *Aphanomyces astaci* spores. Identification of new populations in the wild is necessary for quick eradication.

Mechanical

Mechanical methods include the use of traps, fyke and seine nets, and electro-fishing. The use of sexual pheromones to attract males is under investigation. Physical methods of control include the drainage of ponds, the diversion of rivers and the construction of barriers, either physical or electrical.

Chemical

Biocides such as organophosphate, organochlorine, and pyrethroid insecticides have been used.

Biological

Possible biological control methods include the use of fish predators, disease-causing organisms and the use of microbes that produce toxins. The use of SMRT is under investigation.

REFERENCES

Gherardi F (2006) *Procambarus clarkii* (crustacean). In: Global Invasive Species Database. Available from: <http://www.issg.org/database/species/ecology.asp?si=608&fr=1&sts=> . Cited 30 Oct 2006

Gherardi F (2006) Crayfish invading Europe: the case study of *Procambarus clarkii*. *Marine and Freshwater Behaviour and Physiology* 39 (3):175–191

Souty-Grosset C, Holdich DM, Noel PY, Reynolds JD and Haffner P (eds) (2006) Atlas of Crayfish in Europe, Museum national d'Histoire naturelle, Paris, 187 p (Patrimoines naturels, 64).

OTHER REFERENCES

Correia AM, Bandeira N and Anastacio PM (2005) Predator-prey interactions of *Procambarus clarkii* with aquatic macroinvertebrates in single and multiple prey systems. *Acta Oecologica* 28:337-343

Cruz MJ, Rebelo R and Crespo EG (2006) Effects of an introduced crayfish, *Procambarus clarkii*, on the distribution of south-western Iberian amphibians in their breeding habitats. *Ecography* 29:329-338

Gherardi F and Holdich DM (eds) (1999) Crayfish in Europe as alien species. How to make the best of a bad situation? A. A. Balkema, Rotterdam, pp XI + 299

Gherardi F and Barbaresi S (2000) Invasive crayfish: activity patterns of *Procambarus clarkii* in the rice fields of the Lower Guadalquivir (Spain). *Archiv für Hydrobiologie* 150:153-168

Author: Francesca Gherardi and Vadim Panov

Date Last Modified: December 14th, 2006