

Castor Oil Plant

Ricinus communis

Silk scarves, Sopwith Camels, espionage, assassinations and frontiers of science

The Castor Oil Plant, *Ricinus communis*, has its origins in north-eastern tropical Africa where it was cultivated in Egypt some 6000 years ago. Well known for its oil, and now dispersed throughout the world. Castor oil is sourced from its seeds, that can contain 40 - 60% oil rich in triglycerides. In ancient times, it was important as a lamp oil and as a purgative in traditional medicine.

In more recent times, it's estimated that about 300,000 tonnes of castor oil are produced every year for a wide range of uses including paint, plastics, waxes and polishes, soap, nylons, pharmaceuticals, lubricants, even perfume. Major centres of world production are India, China, Mozambique and Ethiopia. First recorded in Australia in 1803, it's now widespread, and a problem in all states of Australia except Tasmania.



The seeds of Castor Oil plants contain a deadly toxin, *ricin*, and the plants have been listed by the Guinness Book of Records as *the world's deadliest common plant*, although we're not entirely sure what they mean by *common*. In 1978, in one of the most infamous incidents involving ricin, a Bulgarian defector, Georgi Markov, was assassinated in London by Bulgarian secret police, using a modified umbrella supposedly provided by Russia's KGB, using compressed air to fire a pellet containing the deadly *ricin* into his leg.



SECRET UMBRELLA MURDER
CLASSIFIED

Georgi Markov was a Bulgarian journalist who had defected to England where he became a BBC broadcaster and proceeded to openly mock his former communist government.

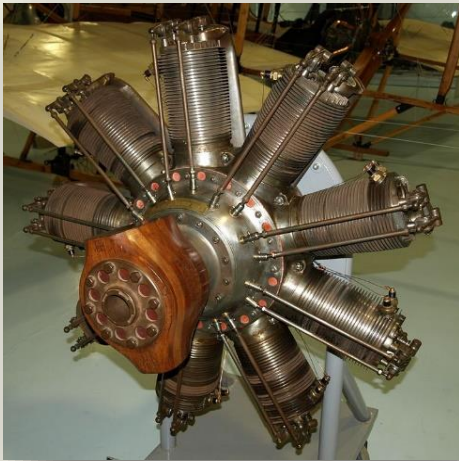
While waiting for the bus a pellet full of poisonous ricin was shot into his leg using a hi-tech umbrella gun. He died a few days later. **The killer was never found.**

Castor Oil is important as a high-quality lubricant, remaining viscous over a wide range of temperatures, and eminently suitable for use in extreme conditions from the cold of the Arctic and Antarctic to the high temperatures of combustion engines.

So now we ask the question: why did WW1 pilots wear white silk scarves? Sure, they certainly looked dashing but there were other reasons. Aircraft flown in the First World War, including the British Sopwith Pups and Sopwith Camels, had rotary engines and castor oil was used as a



Sopwith Camel - Unknown RAF photographer, Public domain, via Wikimedia Commons



Clerget 9B rotary aero engine used in many Sopwith Camels.
Photo: Nimbus227, Public domain, via Wikimedia Commons

lubricant, ideal as it was not denatured by the extreme heat and centrifugal force of the engines. Using a simple flow-through system, castor oil was fed from a tank through the engine and vented overboard. It was not recycled. Unfortunately for the pilots, their goggles become misted with castor oil and scarves were essential to wipe goggles clean, hence the choice of white. Another unfortunate effect of the castor oil unavoidably swallowed by pilots was its purgative effect, resulting in pilots suffering from constant bouts of diarrhoea. In recent years, synthetic oils, more stable and less toxic, have replaced castor oil as a lubricant.





Seeds: Schnobby, CC BY-SA 3.0

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Young seedling: Filo gèn', CC BY-SA 4.0

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In the 1950s two of the twentieth century's most eminent biochemists turned to the castor oil plant to figure out how plants converted **fats (oils) to sugars** – a critical question in the metabolism in plants and animals. This revealed the **glyoxylate pathway**, an entirely novel route for the conversion of fats to carbohydrates, supplying an alternative source of metabolic energy. Without this unctuous model plant, the glyoxylate pathway might have waited many years before being revealed.

The background of the lead author, **Hans Kornberg**, is typical of the era.



Sir Hans Leo Kornberg, co-discoverer of the **glyoxylate pathway**. Photo: Trudy Nguyen, CC0, via Wikimedia Commons

His Jewish parents were both murdered in the Holocaust after sending their son to safety in England, where he was able to pursue a purposeful and productive life as a biochemist. In 1960, he was appointed to the first Chair in Biochemistry at the University of Leicester and in 1978 he was knighted in the Queen's Birthday Honours List for *services to science*.

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Wikipedia: https://en.wikipedia.org/wiki/Castor_oil

Wikipedia: https://en.wikipedia.org/wiki/Hans_Kornberg

Wikipedia: <https://en.wikipedia.org/wiki/Ricinus>

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