

Did you know that Aboriginal people used the woolly material found around the base of the fronds on top of the trunk of Zamia Palm as a nappy, many years before modern science developed polymers, such as polyacrylic acid.



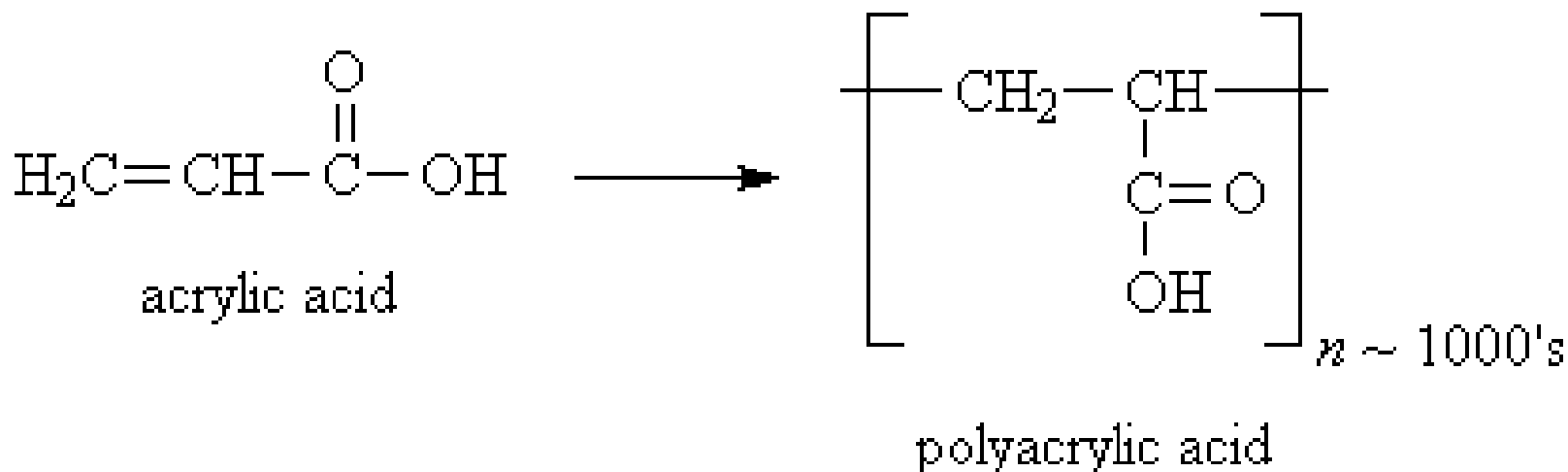
Zamia Palm (Scientific name: Macrozamia riedlei, Aboriginal name: Jeeriji)

Left: woolly material from Zamia Plant, Right: modern baby nappy

Polymer in Baby Diapers!

Modern baby diapers contain polyacrylic acid, a super-absorbent polymer. Polyacrylic acid is a polymer made from the monomer acrylic acid. These long chains contain thousands of monomer units, and the polymer also has some cross-linking between the chains. Polyacrylic acid polymer is very **hydrophilic**, ie. LOVES WATER! That's because of the **carboxylic acid** groups (COOH) in the polymer, which can **hydrogen-bond** to water molecules.

Diapers contain a small amount (4-5 grams) of polyacrylic acid in a powder form, which is mixed into the fluff in the middle layer of the diaper. The inside layer of the diaper allows water to pass through it into the absorbent middle layer, and the outer layer is waterproof. Polyacrylic acid can absorb about 30 times its weight in water, or about 30 mL of water per gram, so a typical diaper can absorb 120-150 mL of water (about a half cup).



Zamia Palm



Scientific name: *Macrozamia riedlei*

Aboriginal name: Jeerj (Noongar)



Plant habit



Seed cone



Seed (Photo: Ram Agar)

About ...

This plant has a male plant and a female plant. The male plant produces the pollen, while the female plant produces the seed. Only the female cones were eaten by the Noongar people.

Early European settlers became ill after eating the seeds without proper preparation, due to the level of toxins and carcinogens.

Proper care must be taken to prepare the seeds (through a lengthy process) for eating!

Aboriginal Uses

- The toxic seeds were used as a food by Aboriginals after extensive processing. European explorers were poisoned from eating them raw
- After treatment, the pulp which encases the seed is roasted before eating, it tastes similar to a tomato
- Raw seeds were ground into a powder and used to 'stun' fish in local waterways to make the fish easier to catch
- The woolly material found around the base of the fronds on top of the trunk was used as fire tinder or as an absorbent fibre for hygienic purposes

Family	ZAMIACEAE
Climate	Temperate
Habitat	Jarraah forests south of Perth to Albany Banksia woodlands
Form	Medium-size shrub Short trunk with leaves from the base Palm-like Height: 0.5 – 3 m
Foliage	Few leaves radiating from trunk Glossy with narrow leaflets Tough Bright-to-deep green Length: 1 – 2 m
Seed	Produced Djilba to Kamarang (September to October) Oval-shaped seed cone Length: 25 – 35 cm Width: 14 – 18 cm Ripe Bunuru (February to March)

Aboriginal people also developed a method to create glue from natural products to make tools!



SYNTHETIC GLUES
 Elastomers, Thermoplastics, Emulsion, and Thermosetting adhesives are based on polyvinyl acetate, epoxy, polyurethane, cyanoacrylate and acrylic polymers.

NAME	STRUCTURE	SAFETY ISSUES
POLYVINYL ACETATE	$\text{R} \left[\text{CH}_2 - \underset{\text{O}}{\underset{\text{COCH}_3}{\text{C}}} - \text{CH}_2 - \underset{\text{O}}{\underset{\text{COCH}_3}{\text{C}}} - \text{CH}_2 - \text{R} \right]_n$	May cause eye, skin, and respiratory irritation and is maybe harmful when swallowed.
EPIDY		Causes asthma
POLYURETHANE		Inert, but when decomposes forms nasty chemicals such as hydrogen cyanide, which is a highly toxic compound.
CYANOACRYLATE		The fumes will irritate sensitive membranes in the eyes, nose and throat. About 5% of the population can become sensitized to cyanoacrylate fumes, after repeated exposure, resulting in flu-like symptoms. It may also act as a skin irritant and may cause an allergic skin reaction.

