

# Hornet juice the secret to success in marathons

The killer insect's stomach fluids reduce muscle fatigue and lactic acid build-up.

By **DAVID HARRISON**

The women's marathon winner at the Sydney Olympics has revealed the secret of her success — she drank the stomach juices of giant, killer hornets that fly 100km a day at up to 25 km/h.

Naoko Takahashi, aged 28, from Japan, consumed the hornet juice during training and the race itself after scientists discovered that it had astonishing powers to boost human stamina.

The bitter-tasting liquid could soon be available to other athletes.

British companies are understood to be in negotiations with the Japanese firm Meiji, which turns the juice into a palatable — and completely legal — drink.

Scientists at the Institute of Physical and Chemical Research near Tokyo began investigating the species of large hornets (*Vespa mandarina japonica*) to find out what gave them the energy to fly the equivalent of more than two marathons in search of food for their young.

The researchers found that the energy source was an acidic juice produced by young hornets and passed back to the adults.

Hornets feed their grubs by killing other insects, chewing the meat into a ball and carrying up to half their own body weight back for the grubs, which are waiting in underground nests.

When the grub has eaten the

insect meat, the adult, in a curious ritual, gives it a kind of tap on the head. This appears to be a signal for the grub to produce a few drops of clear liquid which is then passed to the adult in a “kiss.”

The adults are totally dependent on this juice because their tiny digestive tracts do not allow them to eat solid foods.

The 5cm grubs — which at this stage are soft white blobs, yet to develop into the adult shape — are able to digest solids.

The task of finding and removing hornets' nests, which contain about 4000 grubs, was difficult and also hazardous for the scientists, even with heavy-duty protective clothing and hard hats.

The 7cm-long adult insects — which grow up to five times the size of a typical wasp — can be lethal.

They kill about 40 people every year.

They also attack and kill whole hives of bees.

The scientists eventually managed to remove about 80 nests and, back in the laboratory, extracted the juice from the grubs using pipettes.

A series of tests was carried out, first on swimming mice and then on students on exercise bicycles. In both cases the conclusion was stark: those who had taken the juice performed almost twice as well as those who had not.

Dr Takashi Abe, who led the research team, said: “Our experi-



**SUCCESSFUL RECIPE:** Naoko Takahashi after winning the Olympic marathon in Sydney.

PICTURE / REUTERS

ments showed that the juice helped mice and humans to transfer fat into energy more efficiently and this is very important in helping athletes' performance.”

The hornet juice — made up of amino acids which can be reproduced in the laboratory — reduced human muscle fatigue, slowed the build-up of lactic acid and improved the body's efficiency.

The scientists worked with the Meiji company to turn the juice into a drink acceptable to humans and it was taken up by many Japanese endurance athletes, including Takahashi, who says it was a crucial factor in helping her to win the Olympic gold medal.

Takahashi's victory confirmed her status as the greatest female marathon runner of all time.

It followed her triumph at the Asian Games in Bangkok two years ago when she finished in 2h 21m

and 47s — the fastest time recorded in a women-only marathon.

The story of the hornet “superjuice” was told in a nature programme on BBC Radio.

Mary Colwell, the producer, said: “It is amazing that this collection of acids found naturally in a hornet seems to change the human body and improve the performance of athletes, and that what works for insects flying long distances also works for humans who run long distances.”

“It is a fascinating case of pure science meeting high-level sports and gives insights into what helps animals and humans reach their peaks of endurance.”

A British Olympic team official said: “This is not something that our athletes have tried, but it sounds as though it might be worth us taking a look at.”

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