

BRACKEN FERN (Group 2B)

A. Evidence for carcinogenicity to humans (*inadequate*)

In a case-control study of 98 oesophageal cancer patients and 476 controls in Japan, a relative risk of 2.7 was found for daily consumption of bracken fern. Interpretation of this study is hampered by the absence of detail about the survey and the method of selecting controls, and by failure to take account of consumption of alcohol, a risk factor for cancer of the oesophagus¹.

B. Evidence for carcinogenicity to animals (*sufficient*)

Bracken fern was tested for carcinogenicity in mice, rats, guinea-pigs, cows and toads by oral administration, producing leukaemia, intestinal tumours, lung adenomas and gastric tumours in mice, small-intestinal tumours, urinary bladder carcinomas and mammary adenocarcinomas in rats, urinary bladder tumours in guinea-pigs, alimentary-tract and bladder cancers in cows, and intestinal carcinomas and hepatomas in toads. Processed bracken fern produced intestinal tumours in rats; boiling-water extracts of bracken fern produced intestinal and bladder tumours in rats; and hot-ethanol extracts produced intestinal tumours in quails¹.

Shikimic acid isolated from bracken fern induced neoplasms of the glandular stomach in mice after a single intraperitoneal injection. Ptaquiloside derived from bracken fern induced mammary and small-intestinal carcinomas in female rats after administration by gavage¹.

Most of these studies involved small numbers of animals and were incompletely reported; however, they indicate that bracken fern is associated with cancers of the intestine and urinary bladder in many different species.

C. Other relevant data

No data were available on the genetic and related effects of bracken fern in humans.

An acetone extract of bracken fern was mutagenic to *Salmonella typhimurium* in the presence of an exogenous metabolic system. Light-petroleum and methanol extracts of bracken fern activated by alkaline treatment were also mutagenic to *S. typhimurium*².

References

¹IARC Monographs, 40, 47-65, 1986

²IARC Monographs, Suppl. 6, 126, 1987