

National scientific fingerprint

National scientific development can be measured by some characteristic indicators. Combining simplicity and usefulness, we can use papers (P) as output, citations (C) as outcome and citations per paper (CPP) as impact¹. The different scientific outputs, outcomes and impacts of different nations² reflect their scientific situation. In this article, we apply national scientific fingerprint for showing the characteristics.

The indicator as fingerprint would better keep stable and different from each other. When we compare the simpler in-

dicators P, CYY and CPP with data collected from the Essential Science Indicators (ESI) database (<http://esi.isiknowledge.com/home.cgi/>) during 1 January 1997 through 31 December 2007, 1 January 1998 through 31 December 2008 and, 1 January 1999 through 31 December 2009, we found C is the best one as national scientific fingerprint, whereas P is changeable and CPP is not sensible for differentiating each other.

Let us consider 10 representative countries: USA and Canada as two American developed countries; England, France, Germany and Italy as four Euro-

pean developed countries; and Brazil, Russia, India and China as four new market countries. We show their national scientific fingerprints (Figure 1) using ESI data from 1 January 1999 to 31 December 2009.

The fingerprint diagrams look like fingers as the citations of the top five fields in them keep few changes for each country, similar to face patterns³, and other figures⁴ as well as academic spectrum⁵.

In the 10 countries listed, only France and Germany show the same top five

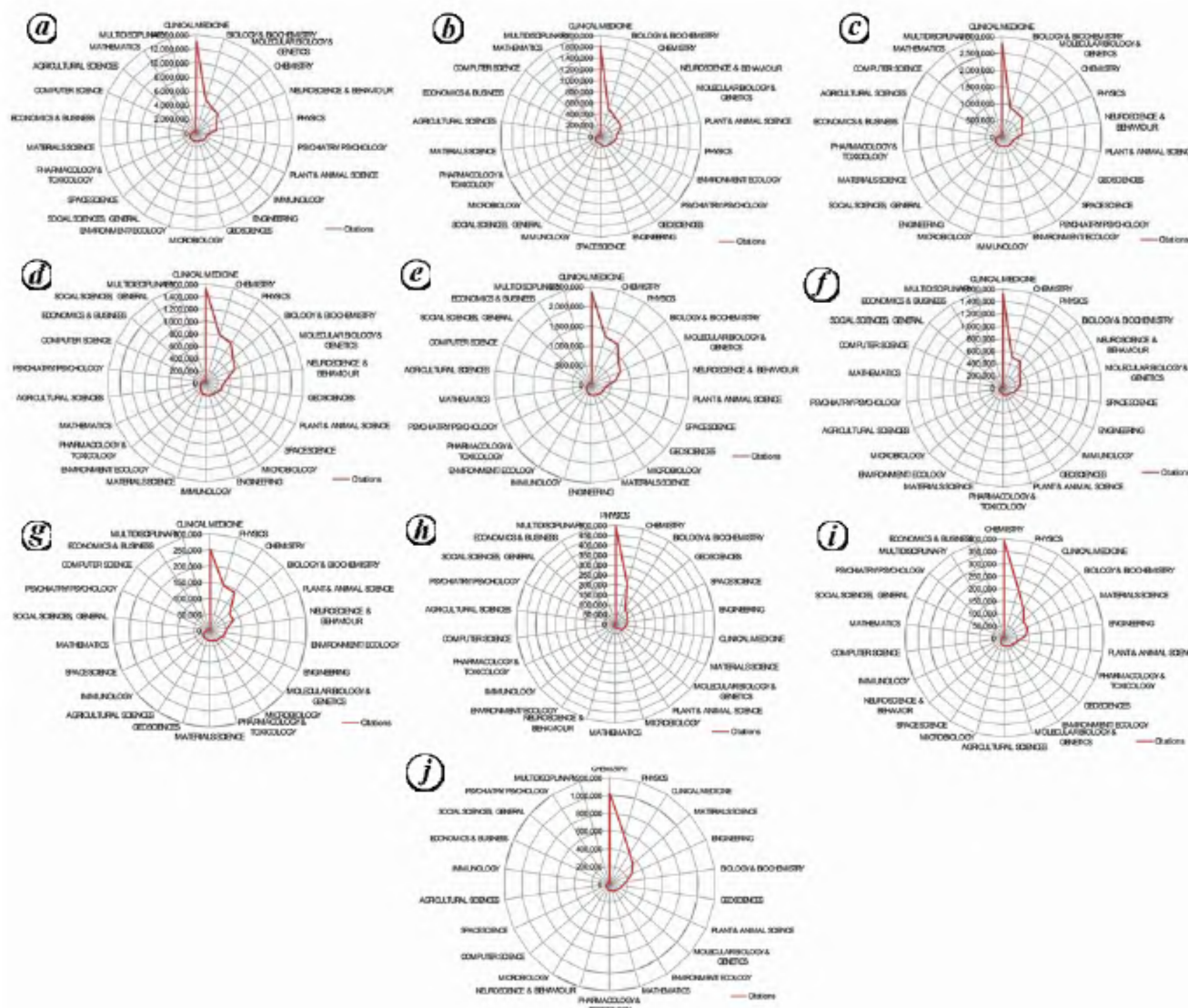


Figure 1. The national scientific fingerprints of 10 countries. *a*, USA; *b*, Canada; *c*, England; *d*, France; *e*, Germany; *f*, Italy; *g*, Brazil; *h*, Russia; *i*, India and *j*, China.

fields, but they have different scaling numbers in outcome. So, Figure 1 provides an overall fingerprint diagram for all the countries.

We can also consider one characteristic for differentiating developed and developing countries, which is the top 1 field. Developed countries show top 1 as clinical medicine, whereas developing nations occupy top 1 with chemistry. Certainly, different countries hold different outcome.

The national scientific fingerprints provide a meaningful and interesting reference for academic comparison at the national level. Fingerprint change means important development.

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Pong Dam Wetlands Sanctuary: a heaven for waterfowls

The Pong Dam on the Beas River, Lower Himalaya, is the second largest man-made reservoir in Himachal Pradesh. The location and dimensions of the Pong Dam lake make it an appropriate habitat for drifting birds entering the plains of India from Central Asia. Pong Dam is home to the Bar-headed goose, one of the highest flying birds in the world; it can fly at a height of about 11,000 m.

In February 2008 during the annual waterfowl census at the Pong Dam, we recorded two species (Slender-billed gull

and Ferruginous Poachard) new to the wetland sanctuary (Figure 1). The Slender-billed gull, a medium-sized bird with elongated head and bill, and belonging to the family Laridae, is distributed from Senegal through the Mediterranean to east Kazakhstan and northwest India^{1,2}. It normally breeds in western Indian Ocean and has been recorded from Gujarat³, Punjab, Delhi⁴ and Kerala⁵. The observed solitary bird was white in colour, with a pinkish tinge extending from the neck to breast. During summer, Slender-billed gulls are recorded to have pinkish colouration near the breast⁴. Even though the IUCN conservation status of this bird is considered as Least Concern, its distribution in India is limited.

Ferruginous Poachard (*Aythya nyroca*) is a winter visitor to the Indian subcontinent². It has been recorded from Pakistan, Bangladesh, northwest India, Manipur, Kerala⁶, Delhi, Gujarat, Haryana, Jharkhand, Madhya Pradesh, Rajasthan, Punjab, Uttar Pradesh, Uttarakhand⁴ and Assam barrage, in Himachal Pradesh⁷. The observed bird had chocolate-coloured body and a dome-shaped head with pure white undertail. This species has undergone a decline in population and change in distribution in the past few decades⁶. According to the IUCN conservation status, this species is considered as Near Threatened⁸.

Over 250 bird species belonging to 54 families have been recorded in Pong Dam. Water bird census was initiated in 1985. Pong Dam Wetlands has emerged as a major habitat for migratory birds in

the country, as also an attraction for bird-watchers. More than 150,000 migratory birds visit this area. One of the major threats to avifauna is fishing; fishermen regularly use motor boats which is a major concern for diving birds. The Forest Department needs to protect land birds like Saras crane and Bar-headed goose which feed in crop lands. If the Forest Department regulates the fishing activity, then the Pong Dam will be a heaven for wetland birds.

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Figure 1. a, Slender-billed gull (*Chroicocephalus genei*); b, Ferruginous Poachard (*Aythya nyroca*). (Courtesy: A. Pragatheesh.)