Eau de Rain Forest

In search of novel scents and tastes, an international fragrance team uses a unique blimp-and-raft device to scour the treetops in the rain forest of Gabon. By Marlise Simons

Up, Up and Away
The blimp has deposited its cargo, a large raft cum research platform from which scientists can explore the forest canopy.

Photographs by Laurent Pyot, Patrick Wallet and Sue Cunningham

On Top Of the World

With its skeleton of orange pontoons, the 6,500-square-foot raft looks like an enormous starfish adrift in a sea of green. It is here, 140 feet off the jungle floor, that the flowers, seeds and fruits are found and here that the trees, under attack from insects, birds and bacteria, produce most of the defensive chemicals that intrigue biologists, especially researchers for the pharmaceutical industry.

On the Scent

Strapped into a harness, a scientist can lower himself from the raft to collect otherwise hard to reach bark and leaves.

fruits and flowers. Researchers are always on the lookout for new sources of essences that can be used in extracts for the food industry and fragrances.

Preparing for Takeoff
In the dawn fog, pilots inflate the 182-foot-long blimp (among the world's largest), which an hour later will ferry scientists and a raft into the treetops.

"Red fruits at 2 o'clock," shouts the pilot from his gondola as he nudges the blimp through dawn mist rising from the exuberant greenery. We are in the equatorial rain forest of Gabon.

Dangling from cables 30 feet below is an inflatable raft with three researchers aboard who reach out and collect fruits from the treetops. The expedition of two dozen scientists here includes not only tropical biologists from a variety of universities but also biochemists from Givaudan Roure, one of the world's largest makers of fragrances and flavors. They sniff at bark and leaves, crack open fruits and nuts and set computerized aroma traps around flowers, hunting for new sources of essences for perfumes and extracts for the food industry.

Components of fragrances and food aromas are big business. Givaudan Roure's chemists mix and match the scents that become the perfumes of top fashion houses like Armani, Balmain and Christian Dior. Their aromas, both natural and synthetic, are sold to food companies and show up in ice creams, yogurts, beverages and stews. Last year the company sold $1.5 billion worth of ingredients.

As nature in cooler climates has been fully explored, the search for new molecules has moved to the tropics. The Gabon expedition, organized by Pro-Natura, a French-Brazilian environmental foundation, is focusing on the rain-forest canopy. Biologists call the canopy the richest but least-known natural frontier on earth. It is where most of the photosynthesis happens and where the flowers, fruits and seeds grow. And it is where the trees, under attack from insects, birds and bacteria, produce most of the defensive chemicals that intrigue biologists, above all researchers for the pharmaceutical industry.

But the 140-foot trees are full of hazards — they sizzle with stinging wasps, ants, scorpions, frogs and poisonous snakes. To circumvent the need to climb, the team has come up with an ingenious new contraption: a huge, colorful blimp lifts a great raft onto the treetops; the raft itself then serves as a research platform. A smaller raft can be flown from tree to tree. The blimp allows scientists to hover quietly, dip down or cruise, without disturbing forest life.

Today, David Josephson, a biochemist for Gi-

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FROM LEFT: LAURENT PYOT/OCV-PN/EURELIOS (2); PATRICK WALLET/EURELIOS

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Aroma Therapy

Above: Essence-filled test tubes for Givaudan Roure at a makeshift laboratory in camp. Right: In 15 minutes, an "aroma trap" set over a fruit or flower draws out its odor, which is then transferred to vials. Chemists can later try to copy it.

Mobile Home

Dubbed the "ikos," this portable observation platform, also placed high up in the trees by blimp, allows scientists to study plants and animals for long stretches of time. The little metal treehouse accommodates a small lab and a couple of weary researchers stretching out for a night.

vaudan Roure, is looking for components that may be useful in the food business. He balances precariously on the raft and leans out and clips samples. All around, parrots flash their colors and outsize butterflies tumble through the light. One treetop is loaded with ink-colored berries, another is brimming with white olives. "Magnificent," he exults. "I've seen nothing like it."

Back at the camp, Josephson and some colleagues probe and taste their finds. "Most of these have African but no Western names," says Frans Breteler, a Dutch botanist from the University of Wageningen. Josephson sniffs a small white flower that smells of raspberry and snaps open a red pod. It gives off an intense spearmint scent. He peels an apricot-size yellow fruit. The white flesh is unctuous, with a hint of maple syrup. "This is really interesting — it could be added to a cereal," he says. A few minutes later the white flesh is turning blue. Does he worry about poison? "When it tastes bitter, I spit it out. I take that as nature's warning to stay away." A fruit like a green tennis ball is cut open. Remarkably, its flesh smells like meat bouillon. "It has this amazing sulfur chemistry, which is the key to meat," Josephson says. "We'll be very interested in seeing how this plant makes this smell. It could show us a new pathway to produce an inexpensive beef flavor. It may be a great find for the vegetarian market."

At night in the camp, as the entire forest hums with crickets and frogs, researchers compare notes. Someone offers Josephson a piece of bark with a strong aroma of garlic and onion. There are leaves that, rubbed on a person's foot, produce an astringent sensation in the mouth. Kelsey Downum, a biologist at Florida International University, has gathered plants whose

FROM LEFT: LAURENT PYOT/OCV-PN/EURELIOS; SUE CUNNINGHAM/OCV-PN/EURELIOS; PATRICK WALLET/EURELIOS

compounds could prove useful as medicines. "About 60 percent of all our medicines originally come from plants," he says. "There is much more to be found."

Several researchers are collecting plants for pharmaceutical companies like Hoechst Marion Roussel and Zeneca. Roman Kaiser, a veteran Swiss fragrance chemist, believes he has detected several new fragrances on this trip. "We found a wonderful resin like a frankincense," he says. "And a plant with a delicate balsamic woody odor." But a heady new scent in the field will not necessarily end up on the perfumer's shelf. "We will analyze it, do dermatological and toxicological tests. Then we may copy part of it. To introduce a new molecule suitable for perfume is very costly."

At dinner the university scientists defend the principle that information about the rain forest should be shared and its research published. The fragrance- and flavor-industry researchers, on the other hand, will take their samples home and keep their information secret to protect their competitiveness. But all agree that economics is a prime incentive for preserving biodiversity. Developing forest products makes more sense for Gabon than cutting the trees down to cultivate the poor soil underneath.

The diminishing habitat is very much on people's minds. It depresses Francis Hallé, a tropical biologist at the University of Montpellier, in France, and the leader of the expedition. "I think of the canopy as a magnificent table covered with many finely prepared dishes and set with crystal and silverware and wine," Hallé says. "Then a fool arrives who says, 'I need some wood.' He starts cutting the legs off the table. And everything comes crashing down and breaks. That is what we have been doing." ■