

POLA VOKALISASI BURUNG TAKUR (*Megalaimidae*) PADA LOKASI PASCA KEBAKARAN HUTAN DI LABORATORIUM ALAM HUTAN GAMBUT ZONA KHUSUS TAMAN NASIONAL SEBANGAU

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INTISARI

Burung Takur (*Megalaimidae*) merupakan kelompok burung yang dapat dijumpai pada habitat hutan rawa gambut. Penelitian ini bertujuan untuk mendeskripsikan komponen biotik dan abiotik penyusun habitat, membandingkan struktur vokalisasi burung Takur, serta mengevaluasi pengaruh mikroklimat terhadap aktivitas vokalisasi burung Takur. Pengambilan data menggunakan desain transek jalur (*line transect*) yang dikombinasikan dengan *systematic sampling* yang dilakukan pada area hutan dan pasca kebakaran. Data biotik diperoleh melalui *nearest sampling* meliputi kerapatan vegetasi, keragaman jenis, dan kerapatan tajuk. Data abiotik (suhu dan kelembaban) dikumpulkan menggunakan *thermohygrometer*. Data bioakustik diperoleh melalui metode *Passive Acoustic Monitoring* menggunakan perangkat *SwiftOne Recorder*, dengan total 18 titik pengamatan akustik. Pengambilan data dilakukan pada 6 jalur transek, masing-masing terdiri dari 3 transek untuk setiap kondisi habitat. Setiap transek terdapat 3 perekam yang dipasang berjarak ± 600 meter, menghasilkan total 18 titik pengamatan. Perekaman dilakukan selama 10 hari kontinu. Dataset dari perekam *SwiftOne* dianalisis menggunakan perangkat lunak Raven Pro 1.6. Identifikasi vokalisasi burung Takur dilakukan secara manual melalui pemindaian visual dan auditori spektrogram, mengacu pada referensi suara dari *The Cornell Lab Macaulay Library* serta aplikasi *BirdNET*.

Hasil penelitian menunjukkan kebakaran hutan menyebabkan degradasi kompleksitas vegetasi sehingga mempengaruhi kestabilan iklim mikrohabitat. Di area hutan, aktivitas vokalisasi berlangsung secara stabil sepanjang waktu aktif. Sebaliknya, di area pasca kebakaran, aktivitas vokalisasi cenderung lebih awal pada pagi hari dengan pola yang fluktuatif sepanjang waktu aktif. Perubahan habitat mendorong burung Takur menyesuaikan vokalisasi guna mempertahankan efektivitas komunikasi, sesuai dengan *Hipotesis Adaptasi Akustik* (AAH). Ketiga spesies burung Takur menunjukkan penyesuaian struktur vokalisasi pada *duration*, *low frequency*, *high frequency*, *peak frequency* dan *energy* yang bervariasi antar-spesies. Kondisi mikroklimat memengaruhi aktivitas vokalisasi burung, di mana ketiga spesies burung Takur menunjukkan penurunan vokalisasi seiring meningkatnya suhu di area pasca kebakaran. Adaptasi terhadap perubahan mikroklimat digambarkan juga dalam penyesuaian durasi vokalisasi sebagai respons terhadap suhu. *C. fuliginosus* dan *P. rafflesii* mengurangi durasi vokalisasi seiring peningkatan suhu efisiensi energi. *P. duvaucelii* menunjukkan toleransi termal lebih tinggi dengan durasi vokalisasi yang stabil. Temuan ini memberikan pemahaman adaptasi burung Takur (*Megalaimidae*) terhadap perubahan habitat akibat kebakaran hutan, yang tercermin melalui respons vokalisasinya.

Keywords : Burung Takur, Pola Vokalisasi, Hipotesis Adaptasi Akustik

VOCALIZATION PATTERNS OF BARBET (*Megalaimidae*)
AT POST-FIRE FOREST SITES
IN THE NATURAL LABORATORY OF PEAT SWAMP FOREST
SPECIAL ZONE OF SEBANGAU NATIONAL PARK

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ABSTRACT

Barbets (*Megalaimidae*) are a group of birds commonly found in peat swamp forest habitats. This study aims to describe the biotic and abiotic components of the habitat, compare the vocalization structures of barbet species, and evaluate the influence of microclimatic conditions on their vocal activity. Data collection was conducted using a *line transect* design combined with *systematic sampling* across forest and post-fire areas. Biotic data were collected through *nested sampling*, including vegetation density, species diversity, and canopy cover. Abiotic data (temperature and humidity) were recorded using a thermohygrometer. Bioacoustic data were collected using *Passive Acoustic Monitoring* with *SwiftOne Recorder* devices at 18 acoustic monitoring points. Data were collected across six transect lines, consisting of three transects for each habitat condition. Each transect was equipped with three autonomous recorders placed approximately 600 meters apart, resulting in a total of 18 observation points. Acoustic recordings were conducted continuously over a 10-day period. Datasets from the SwiftOne recorders were analyzed using Raven Pro 1.6 software. Barbet vocalizations were identified manually through visual and auditory inspection of spectrograms, referencing sound archives from *The Cornell Lab Macaulay Library* and the *BirdNET App*.

The results indicate that wildfire lead to vegetation degradation and destabilize the microhabitat climate. In forested areas, barbet vocal activity remained stable and gradually increased throughout the active period. In contrast, in post-fire areas, vocal activity began earlier in the morning and exhibited a fluctuating pattern throughout the active period. Habitat changes prompted Barbet species to adjust their vocalizations to maintain communication efficiency, in line with the *Acoustic Adaptation Hypothesis* (AAH). All three barbet species showed interspecific variation in vocal structure adjustments, including *duration*, *low frequency*, *high frequency*, *peak frequency*, and *energy*. Microclimatic conditions significantly influenced vocal activity, with all three species showing reduced vocalization as temperatures increased in post-fire areas. Adaptations to microclimate changes were also reflected in vocal duration: *C. fuliginosus* and *P. rafflesii* shortened their calls in response to rising temperatures to conserve energy, whereas *P. duvaucelii* maintained stable call durations, indicating higher thermal tolerance. These findings provide insights into how Barbets (*Megalaimidae*) adapt to habitat alterations caused by forest fires, as reflected in their vocal responses.

Keywords : Barbet, Vocalization Pattern, the Acoustic Adaptation Hypothesis