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河川植生の分布と河道水理特性について

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1. はじめに

河川区域内の植生は流況に直接関与しながら、その一方で多様な生物に棲息場を提供するなど河川環境の基本的な条件を構成している。その河川植生を将来とも河川の重要な河道要素・環境条件と認識し、中長期的な河川植生の存在状態を出水規模や頻度および河道特性との関係で予測し評価する方法を確立する必要がある。本研究では、河道特性がどのように植生域の消長に関与してくるのかを明らかにするため、富士川水系の上流部である釜無川とその支川である笛吹川を対象として、植生分布と河道特性との関係を見いだすことを目的とした。前の研究¹⁾では植生分布を航空写真からの判読によったが、今回は、建設省で平成3年に行われた植物調査による富士川現存植生図から植生分布を読みとり河道特性との関係を調べた。

2. 植生別面積と河道特性を表す無次元量との関係

富士川上流部本川25kmと支川笛吹川の26kmを対象区間とした。富士川現存植生図から1km区間内の植生別面積(Ai)、現存植生域(ΣAi)を読みとる。河道特性に関しては次元解析による無次元量^{2) 3)}

$$\phi\left(\frac{B}{H}, \frac{d}{H}, Fr, Re, \tau_{*}\right)=0 \quad [\text{文字・記号は慣用のものを用いた}]$$

のうち、砂州の形態にかかわる B/H 、流砂量に関する $\tau_{*}=\tau_{*}$ 、流況を知るための Fr 、また河道の湾曲効果を考える意味で $1/r$ の4つの無次元量を用い、富士川現存植生図(平成3年)、富士川河床材料調査(昭和61年3月)、流下能力調査(平成4年 釜無川 平成3年 笛吹川)のデータと富士川水系計画高水量配分をもとに1km区間平均の値を求める。図-1(a)(b)、図-2(a)(b)は、それぞれ釜無川、笛吹川における植生別面積(Ai)と無次元量との関係の例を示す。

図-1(a)、図-2(b)によれば、荒地地草本植物群落や川辺樹林の面積は無次元量($\tau_{*} \cdot 1/r$)が増大すると減少し、減少すると増大するほぼ反比例の関係が成り立つ。図-2(a)から、つる性植物群落は中・下流域の B/H 30~55で繁茂することがわかる。図-2(b)で、低層湿原草本群落にはツルヨシ、ヨ

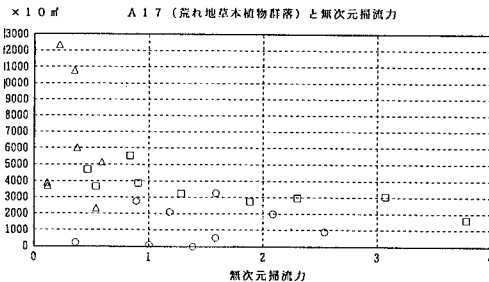
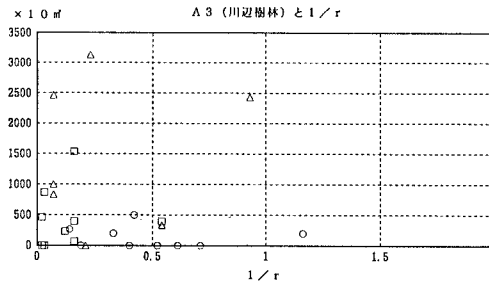
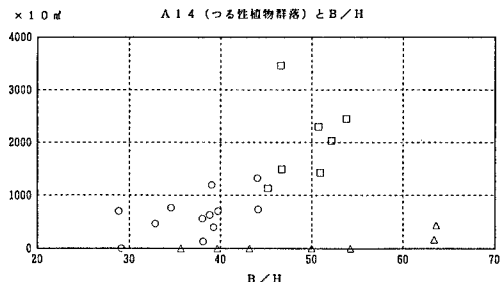
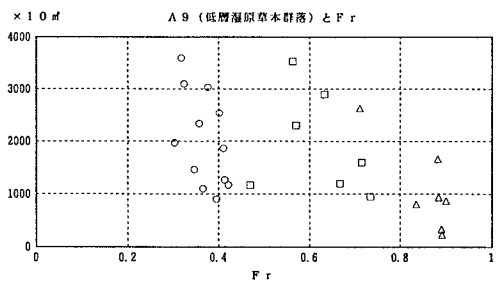
図-1(a) 釜無川のAiと τ_{*} 図-1(b) 釜無川のAiと $1/r$ 図-2(a) 笛吹川のAiと B/H 図-2(b) 笛吹川のAiと Fr

表-1 釜無川のA_iと無次元量

	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆	A ₇	A ₈	A ₉	A ₁₀	A ₁₁	A ₁₂	A ₁₃	A ₁₄	A ₁₅	A ₁₆	A ₁₇	A ₁₈	A ₁₉	A ₂₀	A ₂₁	A ₂₂	A ₂₃	A ₂₄	A ₂₅	A ₂₆	A ₂₇	A ₂₈	A ₂₉	A ₃₀	A ₃₁	A ₃₂	A ₃₃	A ₃₄	A ₃₅	A ₃₆	A ₃₇	A ₃₈	A ₃₉	A ₄₀	A ₄₁	A ₄₂	A ₄₃	A ₄₄	A ₄₅	A ₄₆	A ₄₇	A ₄₈	A ₄₉	A ₅₀	A ₅₁	A ₅₂	A ₅₃	A ₅₄	A ₅₅	A ₅₆	A ₅₇	A ₅₈	A ₅₉	A ₆₀	A ₆₁	A ₆₂	A ₆₃	A ₆₄	A ₆₅	A ₆₆	A ₆₇	A ₆₈	A ₆₉	A ₇₀	A ₇₁	A ₇₂	A ₇₃	A ₇₄	A ₇₅	A ₇₆	A ₇₇	A ₇₈	A ₇₉	A ₈₀	A ₈₁	A ₈₂	A ₈₃	A ₈₄	A ₈₅	A ₈₆	A ₈₇	A ₈₈	A ₈₉	A ₉₀	A ₉₁	A ₉₂	A ₉₃	A ₉₄	A ₉₅	A ₉₆	A ₉₇	A ₉₈	A ₉₉	A ₁₀₀	A ₁₀₁	A ₁₀₂	A ₁₀₃	A ₁₀₄	A ₁₀₅	A ₁₀₆	A ₁₀₇	A ₁₀₈	A ₁₀₉	A ₁₁₀	A ₁₁₁	A ₁₁₂	A ₁₁₃	A ₁₁₄	A ₁₁₅	A ₁₁₆	A ₁₁₇	A ₁₁₈	A ₁₁₉	A ₁₂₀	A ₁₂₁	A ₁₂₂	A ₁₂₃	A ₁₂₄	A ₁₂₅	A ₁₂₆	A ₁₂₇	A ₁₂₈	A ₁₂₉	A ₁₃₀	A ₁₃₁	A ₁₃₂	A ₁₃₃	A ₁₃₄	A ₁₃₅	A ₁₃₆	A ₁₃₇	A ₁₃₈	A ₁₃₉	A ₁₄₀	A ₁₄₁	A ₁₄₂	A ₁₄₃	A ₁₄₄	A ₁₄₅	A ₁₄₆	A ₁₄₇	A ₁₄₈	A ₁₄₉	A ₁₅₀	A ₁₅₁	A ₁₅₂	A ₁₅₃	A ₁₅₄	A ₁₅₅	A ₁₅₆	A ₁₅₇	A ₁₅₈	A ₁₅₉	A ₁₆₀	A ₁₆₁	A ₁₆₂	A ₁₆₃	A ₁₆₄	A ₁₆₅	A ₁₆₆	A ₁₆₇	A ₁₆₈	A ₁₆₉	A ₁₇₀	A ₁₇₁	A ₁₇₂	A ₁₇₃	A ₁₇₄	A ₁₇₅	A ₁₇₆	A ₁₇₇	A ₁₇₈	A ₁₇₉	A ₁₈₀	A ₁₈₁	A ₁₈₂	A ₁₈₃	A ₁₈₄	A 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