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A Note on "On Multivalent Functions with Negative and Missing Coefficients"*

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In this note we shall use the same notations and terms as ones in [1,3].

Very recently, Sarangi and Patil [1] considered the subclass $P_k(p, A, B)$ of analytic p-valent functions with negative and missing coefficients and proved seven theorems concerning the class $P_k(p, A, B)$. Theorems 1,2,3,5, 6 and 7 of [1] generalize the corresponding results obtained by Goel and Sohi [2] from $k = 1$ to $k \geq 2$. However, it is easy to see that such a generalization is trivial and simple.

In 1988, the author [3] introduced and studied the subclass $K^*_{n,p,k}(A, B)$ of analytic p-valent functions with negative and missing coefficients by using the $(n + p - 1)$th order Ruscheweyh derivative D^{n+p-1}. We point out that all the results, except that of Theorem 1, of [1] can be obtained as special cases of our results in [3]. In fact, since $D^{n+p-1}f(z) = f(z)$ and $D^{n+p}f(z) = (1 - p)f(z) + zf'(z)$ for $n = -p + 1$, if we let $k \geq 2, n = -p + 1$ and $B + \frac{A'-B}{2p} = A$, then $K^*_{-p+1,p,k}(A', B) = P_k(p, A, B)$. Thus Theorem 2, part (i) of Theorem 8, part (iv) of Corollary 5 (with $\beta = 0$), Theorem 5 and Theorem 6 in [3] reduce to Theorems 2,4,5,6, and 7, respectively. Also, Theorem 4 and the first part of Corollary 4 in [3] yield the distortion and covering theorems for the class $P_k(p, A, B)$ as follows :

Theorem *If $f(z) \in P_k(p, A, B)$ then we have*

(i) $|z|^p - \frac{p(A-B)}{k(1-B)+p(A-B)}|z|^{p+k} \leq |f(z)| \leq |z|^p + \frac{p(A-B)}{k(1-B)+p(A-B)}|z|^{p+k}$ *and* $p|z|^{p-1} - \frac{p(p+k)(A-B)}{k(1-B)+p(A-B)}|z|^{p+k-1} \leq |f'(z)| \leq p|z|^{p-1} + \frac{p(p+k)(A-B)}{k(1-B)+p((A-B)}|z|^{p+k-1}$;

(ii) The unit disc E is mapped by $f(z)$ onto a domain that contains the disc $|w| < \frac{k(1-B)}{k(1-B)+p(A-B)}$. *The results are sharp with the extremal function* $f(z) = z^p - \frac{p(A-B)}{k(1-B)+p(A-B)} \cdot z^{p+k}$.

The above theorem corrects an error in [1].

References

[1] Sarangi, S. M. and Patil, V. J., *On multivalent functions with negative and missing coefficients,* J. Math. Res. Exposition 10(1990), No. 3, 341-348.

[2] Goel, R. M. and Sohi, N. S., *Multivalent functions with negative coeffcients,* Indian J. Pure Appl. Math. 12(1981), No. 7, 844-853.

[3] Yang Dinggong, *A class of p-valent functions with negative coefficients,* J. Suzhou Univ. 4(1988), No. 1, 13-25 (in Chinese).

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